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T H E F A R M E R.

COMPREHENDING THE SEVERAL
Most interesting Objects and beneficial PRACTICES

IN THE CULTURE OF

WHEAT,	PEAS,	FLAX,	CABBAGES,
RYE,	BEANS,	WELD,	CLOVER,
BARLEY,	TARES,	TURNIPS,	LUCERNE,
OATS,	RAPE,	CARROTS,	SAINTFOIN,
BUCKWHEAT,	HEMP,	POTATOES,	&c. &c. &c.

With the Application and Value of their Products, &c.

Together with the Cultivation of

HOPS, VINES, FOREST TREES, FRUIT TREES, KITCHEN
and FLOWER GARDEN PRODUCTIONS.

L I K E W I S E,

DIRECTIONS in the BREEDING and IMPROVEMENT of
HORSES, OXEN; COWS, CALVES, SHEEP,
L A M B S, and H O G S;

With Remarks for Purchasing, Feeding and Disposing of them to greatest Advantage;
and the Methods of Preventing and Removing their most fatal Disorders.

A L S O,

RULES for the TREATMENT and REARING of POULTRY, viz.
PHEASANTS, || GEESE, || TAME RABBITS,
TURKEYS, || FOWL, || PIGEONS, &c.

A N D

The ORDERING of BEES, and their LABORS.

To which is prefixed,

AN INTRODUCTORY ESSAY,

Calculated to give a clear and perspicuous

VIEW of the Theory of AGRICULTURE, and its Progress
from earliest Antiquity to the present Time.

By • J O S I A H R I N G S T E D; Esq;

Author of the CATTLE KEEPER'S ASSISTANT, or Complete Directory for
Country Gentlemen, Sportsmen, Farmers, Graziers, Farriers, Game and Cow
Keepers, Horse Dealers, Carriers, &c. and a DIARY, containing Tables for
the easier Arrangement of the Accounts of the Business of Gardening, Cattle
Keeping, Game Keeping, &c. &c.

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P R E F A C E.

THE COUNTRY GENTLEMAN and FARMER are here presented with a work, compiled (on a principle of furnishing them with useful information at a small expenditure of time and money) from the most discerning and approved writers on husbandry in its various branches.

Those treatises on farm and garden business extant which command the titles of *complete* and *universal*, are rather *completely* and *universally* in favor of their authors and booksellers, than *clear* and *satisfactory* to the practitioner or artisan in agriculture; and the generality of such as have made abridgements from them, have been misled into a prolixity on matters known familiarly with country people.

One aim in this performance has been to avoid, as much as possible, reiterated calculations and tables of

disbursements; while, on the other hand, the greatest care and pains have been used to supply investigations of a more important nature, and to exhibit the most beneficial courses and forms employed in the conduct of rural occupations.

And though regulations for cultivating *every produce of the field* would have required a more extensive plan, yet this which is now offered comprehends directions for obtaining an advantageous crop on *every kind of soil*; the genius of the varieties of earths and suitable plantations for them being distinguished, and an order of succession of growths pointed out for correcting untoward or ill-habited lands.

Any article of new or improved practice introduced amongst these, will be readily perceived, by very apparent consequences, to be valuable and interesting; and the industry and expence recommended for the prosecution of it, will be well repaid in the latitude of returns on such product, or plan of culture.

But not to advance minutely on the incidents contained in the ensuing pages, I shall lay down the scope and division of them in manner following.

I. INSTRUCTIONS FOR THE CULTIVATION OF CORN, PULSE, ROOTS, &c. in which are stated the advantages and disadvantages of the different methods of tillage;
the

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the qualities of the divers seed for each produce, and the quantity and time for sowing; with the most consistent and profitable appropriations of the crops, &c, Likewise, DIRECTIONS FOR PLANTING HOPS, VINES, AND SUCH FOREST TREES, FRUIT TREES, AND GARDEN PRODUCTIONS, as are commonly possessed by the farmer, and not unfrequently with his own labor. To the above are added, A FEW HINTS ON THE APPLICATION OF COMMON MEADOW LANDS.

II. GENUINE REMARKS ON BREEDING AND PURCHASING OF CATTLE—These are clear and concise, and founded on practical observation of good and responsible authority. Also, the most successful and expeditious methods of REARING AND FATTING CATTLE, SHEEP, &c. in which their food for the several seasons of the year, the manner of feeding them, and the MEANS FOR THEIR PRESERVATION FROM INFECTION AND DISEASES, are nominated and ascertained.—As the breeding of cattle, for feeding on vegetables that are easily raised and deriving manure from them, is an essential part of husbandry; and as their maintenance in soundness is likewise inseparably connected with an enlargement of the farmer's gains—the utility of the inferences under the above heads is obvious, and it is presumed many advantages will flow from an equal regard being paid to them,

III. POULTRY. The different kinds of poultry whose descriptions form the third section of the following work consist chiefly of those which are bred for promoting some intentions and pursuits in the farming business as, for instance, the clearing the lands of noxious reptiles and weeds; their dung; the inconsiderable charges of their keep, in comparison of the price they bring in the market; &c.

IV. THE OECONOMY OF BEES has been given, because their very serviceable preservation, and the procuring the noble advantages of their labors, are reckoned among the concerns of husbandry.

V. The ADDENDA contains some farther propositions respecting THE KNOWLEDGE AND MANAGEMENT OF LANDS AND CATTLE, THE APPLICATION OF MANURES, &c. which are apposite to the design of the present undertaking; and the editor trusts the place of them will not require an apology from him.

*Thus, Here the Rustic learns to sow his grain,
To fertilize his Fields, and wealth t' obtain;
To make the Gardens' blooming pride abound,
With fragrancy, and food, and med'cine crown'd:
How various Cattle, with keen sense, to chuse;
And for most profit in each kind—their use:
What fostering care to Poultry due, may see;
And how t' improve the labors of th' industrious Bee.*

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The INTRODUCTORY ESSAY is selected as a short sketch of the history of agriculture, that traces it, from its origin, through the various stages of attention with which it has been received and extended in its usefulness, by the greatest names and nations in the world, to the present time; and being calculated to convey an idea of the *theory* or *science* of HUSBANDRY, was esteemed admissible to precede the illustration and explanation of the *practice* of it as an *art*.



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HORSES, | COWS, | SHEEP, | HOGS, and
OXEN, | CALVES, | LAMBS, | DOGS,

(with Descriptions of the Symptoms) digested under their proper Heads. To which are added, STRICTURES on the MANAGEMENT of CATTLE, in order to a healthy Propagation and Increase of their several Species, and a Prevention of their Maladies.

By JOSIAH RINGSTED, Esq;

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HORSES; | DEER;
BULLOCKS, COWS, & CALVES; | POINTERS & SPANIELS;

With a Column for OBSERVATIONS on the WEATHER, and
SPACE for REMARKS.

A N

INTRODUCTORY ESSAY,

CONTAINING

AN ACCOUNT OF WHAT IS COMPREHENDED IN THE TERM AGRICULTURE, OR HUSBANDRY. ITS RISE AND PROGRESS. BY WHOM EXTENDED IN ITS UTILITY. THOUGHTS ON ITS ADVANTAGES. SOME OBSERVATIONS FOR SUCCESS IN THE PROSECUTION OF THIS ART.

THE art of agriculture, according to sacred history, is co-eval with time itself; and became the designation and employment of man almost as soon as formed. It consists of tilling or cultivating the earth, in order to render it fertile, and make it bear plants, trees, fruits, &c. The principal and most general operations in agriculture are manuring, ploughing, fallowing, sowing, harrowing; as also, reaping and mowing. To the operations of agriculture do also belong the management of the productions of particular countries; as hops, hemp, vines, tobacco, saffron, liquorice, woad, &c. To the same art belong, planting, transplanting, pruning, engrafting; the culture of forests, timber, copses, &c. Even gardening, or horticulture itself, is only a branch of agriculture. Agriculture, in its most extensive sense, comprehends feeding and the management of cattle, and the rural sports, hunting, fishing, &c. some even include under it the business of mines, coal pits, and other subterraneous matter.

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This art has been cultivated by many of the greatest men among the ancients, and has been treated of by their most celebrated authors. The history of its rise and progress may be easily traced from the first period of time; and it has been more or less the subject of attention in every age and nation of the world.

The ancient patriarchs, though devoted to a pastoral life, were not altogether ignorant of agriculture; and their descendents, as soon as they were settled in Palestine, considered it as a very honorable employment. From them it was transmitted to the Chaldæans, and Egyptians; to the Phœnicians and Carthaginians; and it was in such repute among the latter, that Mago, their famous general, wrote twenty-eight books on the subject, which were afterwards translated into Latin by an express decree of the Roman senate.

It has been said, that agriculture was first introduced among the Europæans by Ceres, Queen of Sicily, in memory whereof she was placed among the principal divinities; a fable, which imports, that Sicily was the scene of considerable improvements.

This art, in some of its branches, has been deemed worthy the application of royalty itself; for history assures us, that Uzziah and Hezekiah, notable Kings of Judah, delighted in agriculture and keeping of flocks; that Darius, the son of Darius Hystaspes, planted the trees of his garden with his own royal hands; and the same is recorded of Cyrus the younger.

Amongst the Assyrians and Persians, the satrapæ (their lords or bashaws of provinces) were rewarded, in whose governments the lands were well cultivated, and those punished who neglected that part of their duty; so zealous were those ancient states to promote the knowledge and practice of agriculture.

The first Greek writer on agriculture was Hesiod; and he was succeeded by Democritus of Abdera, Xenophon, Aristotle, Theophrastus, &c. Some of whom, with Plato, have noted this article as an essential subject in politics. After the above may be remembered the
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illustrious names of Hiero II. of Syracuse, Attalus King of Pergamus, and Archelaus of Cappadocia, who severally wrote and compiled treatises on this art.

It is well known that agriculture was in high reputation amongst the Romans; and that it was cultivated by their emperors, dictators, and consuls. Numa Pompilius, one of the wisest kings antiquity mentions, and who best understood and discharged the duties of the sovereignty, divided the whole territory of Rome into different cantons. An exact account was rendered him of the manner in which they were cultivated; though sometimes he inspected them himself; when, judging of the disposition of the people, by the condition of their farms, he would advance some to posts of honor, and on the other hand reprimand and endeavor to reform the negligent and the idle. Ancus Martius, the fourth king of the Romans, next to the adoration of the gods, recommended nothing so much to the people, as the cultivation of lands and the breeding of cattle. Cato the Censor being asked what was the surest and shortest method to enrich a country, replied, the feeding of cattle, which is attended with an infinity of advantages to those who apply themselves to it with industry and diligence.

The first Latin treatise upon Agriculture was composed by M. Cato the Censor; Varro likewise is the author of a very elaborate work on the same subject, in which he has cited no less than fifty writers on this art, all of whom are Greeks. Columella, in the reign of the Emperor Claudius, wrote twelve books on husbandry; and in the reign of Constantine IV. a new work, as some say, collected by himself from the best writers, was published under the title of Geoponics, with a view of reviving this art, which was now in a very declining state.

In England, the first person who distinguished himself in the practical part of husbandry was Fitzherbert, who published two treatises on this subject; one intitled

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tled *The Book of Husbandry*, in 1534; and the second, called *The Book of Surveying and Improvements*, in 1539.

In 1660, the French made considerable efforts to revive husbandry, and several large works appeared for this purpose. It was likewise industriously cultivated about the same period by the Flemings, who portioning out their lands in small tenements, and discovering new sorts of manure, brought the soil hereby to a proper degree of cleanliness, health, and sweetness; so that they were able to raise the more delicate grasses, such as lucern, faintfoin, &c.

The most considerable English writers, previous to the restoration, were, Sir Hugh Platt, who made many very important discoveries with respect to the nature and qualities of manure; Gab. Plattes, and S. Hartlib; and since that period, Evelyn, Nourse, Mortimer, Bradley, Lawrence, Tull, Ellis, Miller; not to mention many more among our cotemporaries.

The attention generally given to this art both at home and abroad, and the numerous societies established for encouraging improvement in the theory and practice of it, both in Europe and America, promise a degree of perfection, of which none in former ages could have any conception. In France there are no less than thirteen societies established by royal sanction, besides many subordinate associations, for promoting agriculture. It is likewise publicly taught in the Swedish, Danish and German universities. The spirit and example of Linnæus and his disciples have very much conduced to the progress of this important and useful art; and the emulation of improving has spread through most of the nations of Europe. In England, the Royal Society, and Society of Arts, &c. in particular, have been signally useful in this respect; and the other associations which are now established in many parts of the country, co-operate with them in forwarding their laudable design.

Among the Japanese, agriculture is in great repute; and among the Chinese it is distinguished by the court
beyond

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beyond all other sciences. The Emperor of China, yearly, at the beginning of spring, goes to plough in person, attended by all the princes and grandees of the empire. The ceremony is performed with great solemnity; and is accompanied with a sacrifice, which the Emperor, as high-priest, offers to Chang-ti, to ensure a plentiful crop in favor of his people.

Agriculture is, in effect, the solid wealth and treasures of a real value, which do not depend upon the opinion of men; which suffice at once to necessity and enjoyment, by which a nation is in no want of its neighbors, and often necessary to them; which make the principal revenue of a state, and supply the defect of all others when they happen to fail. For, though mines of gold and silver should be exhausted, and the species made of them lost; though pearls and diamonds remain hid in the womb of the earth and sea; though commerce with strangers be prohibited; though all arts, which have no other object than embellishment and splendor, be abolished; the fertility of the earth alone would afford an abundant supply for the occasions of the public; and furnish assistance both for the people and armies to defend it.

We may therefore pertinently introduce the animadversion of Columella in favor of agriculture in this place. He says, speaking of the many different schools of arts in Rome; "However, the rest might well be spared; and the republic flourished long without any of those frivolous arts; but it is not possible to want that of husbandry, because life depends upon it.

"Besides, is there a more honest or legal means of preserving or increasing a patrimony? Is the profession of arms of the kind, and the acquisition of spoils always dyed with human blood, and amassed by the ruin of an infinity of persons? Or is commerce so, which tearing citizens away from their native country, exposes them to the fury of the winds and seas, and drags them into unknown worlds in pursuit of riches? Or is the trade of money and usury more laudable,
"odious,

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“ odious and fatal as they are, even to those they seem
“ to relieve? Can any one compare any of these me-
“ thods, with wise and innocent agriculture, which
“ only the depravity of our manners can render con-
“ temptible, and by a necessary consequence, almost
“ barren and useless?”

The ancients judged three things necessary to success in agriculture, which are worthy reciting for the information of those who are concerned in the art, for subsistence or otherwise, viz. The *Will*; this employment should be loved, desired, and delighted in, and followed in consequence out of pleasure. The *Power*; it is requisite to be in a condition to make the necessary expences for the breeding and fattening of cattle and fowl of all sorts; for labor and whatever is necessary to the manuring and improving of lands; and this is what most of our husbandmen want. The *Skill*; it is necessary to have studied maturely all that relates to the cultivation of lands, without which the two first things are not only ineffectual, but occasion great losses to the master of a family, who has the affliction to see, that the produce of the land is far from answering the expences he has been at, or the hopes he had conceived from them; because those expences have been laid out without discretion, and without knowledge of the application of them. To these three heads a fourth may be added, which the ancients had not forgot, that is, Experience, which presides in all arts, is infinitely above precepts, and makes even the faults we have committed our advantage; for from doing wrong, we often learn to do right.

INSTRUCTIONS

Instructions in Husbandry.

CHAPTER I.

C O R N.

I. W H E A T.

WHEAT, on account of its instrumentality in the chief support of life, is generally placed in the front of agricultural works.

In performing the business for raising wheat, and obtaining a profitable crop of it, diligent, complete and good husbandry, are as requisite to insure success, as good weather.

Wheat produced by drilling, whether on ridges for horse hoeing, or in equally distant rows for hand hoeing only, is better than in the scattering or broad-cast way; and the soil, having by this mode of culture frequent opportunities of imbibing the dew, and being well nourished by it, is greatly improved without further expence. Besides, after a crop that has had the application of horse hoeing, the soil is ready for any fresh product, as will be hereafter particularly specified. But, it must be owned, that a cultivation in rows is more liable to mildew, than one otherwise ordered.

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The land must be well pulverized against the season when weeds grow, in order to their extirpation; which cannot better be effected than with ploughings given in September and October. But, where winter rains, or other apparent causes, may do hurt to the land, the want of ploughing must be dispensed with.

Manure laid on wheat lands in too great quantities, brings up the weeds with the wheat in such manner as renders their destruction impossible; and thus the soil becomes almost wholly possessed with them.—When the fallow is broken up, the weeds are more easily discerned and eradicated; and then is the properest time for manuring.

The following compost or manure, which is a sufficient quantity for an acre, has been recommended to be sown before or after the seed for wheat, or any kind of grain, in the broadcast method, viz. Twelve pounds of common salt, one pound of salt petre in powder, mixed with twenty bushels of wood or coal ashes finely sifted.

On moist, flat soils (which defeat the industry and care of the farmer to procure good crops), when the stubble of wheat and barley is dark, and the stalk appears to be withered, or deadened by wet, a covered drain, dug where the above effect is most observed, may remedy this evil. It is to be formed wider at top than at the bottom, and descending, the depth, length, and width according to the degree of wetness in the soil. This drain must have at the bottom a layer of large stones, or faggots of brushwood, or other wood more durable (occasioning hollows for the water to run in), so far beneath the surface as to be out of the reach of the plough; straw may be a second layer, and then a bed of earth. The benefit resulting from this will be found, in the tillage and crops of succeeding years, evidently to merit the expence; since, without it, the best manuring and preparation are of no comparable service to such land. Barley may also be sown sooner, and expectations of a good crop more reasonably entertained, with this necessary acquisition.

Water

Water furrows, on flat wheat lands, are important, and must be had, even where covered drains are provided, though their number, for this reason, need not be so great. Heavy and hasty rains must be carried off the lands quickly, which cannot be done without water furrows. In making them, a good judgment is requisite, to adapt those parts which may best answer the intention of the business. Ploughing is the first operation; afterwards, the depth of a spit is to be dug for opening the furrow, to admit the running of the water; and the mould is to be shovelled out. A ploughing of itself, is insufficient.

Some valuable crops are liable to damage from hogs and sheep breaking through hedges, fences, &c. Corn fields should, therefore, be very well secured, and particularly the parts where the courses of the ditches are broken; strong paling, the central pieces slanted and longer than those of the sides, perhaps, will form the best kind of resistance; the durability of which, makes the trouble and expence in the end less, than with cheaper methods that are wanting perpetual reparation. Ditches, four or five feet deep, and three or four wide, will become so many drains (which are of admirable utility in wet lands), at the same time they serve, with hedges, for the best kind of fences.

The following wheats for seed have been tried, and are well recommended; and their qualities for general use, will confirm the choice of them.—But the seed for wheat, and every other product, should be sifted and separated from the seeds of weeds and foulness frequently found among them, which if sown, spring up with the crops, impoverish them, and otherwise render their cleaning more difficult.

The Worcestershire wheat is famed for the largest product, and claims the greatest price.—Russia and Dantzic wheats take the next rank; and the Spanish follows, as being near upon an equality: But the soil must combine when they produce more than the common seeds, for on that, principally, depend the variations.—

The common bearded wheat, and that from the Isle of Thanet, command the next greatest produce; but the value of the latter exceeds.—Wheat from the Vale of Evesham is excellent for feed; and the Kentish red wheat is very fine.—To these, the seed from Cambridge-shire yields, though, in some respects, it be good.

Bearded wheats produce largely, but are inferior in quality to the red and white wheats.

Wheat must be brought from a distant part; any that has been raised near the spot, being unprofitable in the product. But observe, clay wheats thrive on a gravel soil, and gravel wheats on a clay soil.

In order to make it produce profitably, seed for this kind of grain may be steeped in brine of salt petre, made strong enough to bear an egg, for twenty-four hours, and dried with lime before it is sown; or, it may be steeped in the drainings of a horse dunghill, during the same number of hours, and dried in the same manner.

The depth of ploughing for corn, is five inches; and clay soils require more ploughing than gravel, chalk, &c.—By the use of an iron plough, in preference to one of wood, the work is more masterly performed, the draught is easier, and the expence of repairs is greatly diminished.

The most useful harrow for burying the seed, has its teeth bent diversely in the different rows. This kind, also, works the land to a greater degree of fineness, than that with strait teeth.

Oxen will perform ploughing, harrowing, carting, &c. as well as horses, and may be kept with lower expences for the business of a farm. Where they are used, lucerne, being a cheap and wholesome food for working oxen, naturally becomes a part of the husbandry.

In sowing of wheat broad cast, two bushels and a half to each acre will be found productive of a better crop than any other portion of seed; and this quantity may be lessened only on land which is rich and well manured. Two bushels, and sowing it in three rows, at
one

one foot asunder, with distances of three feet for horse hoeing, or in rows equally distant, in the drilling method, are the general quantity, and most beneficial forms. The product of wheat on an acre is from three to four or five quarters.

Corn should always be thick sown; as it then prevents the vegetation of weeds, which annoy and hinder the crop, and prove very disadvantageous to the farmer. And, the land will require more seed when clover is sown with wheat, than when wheat alone succeeds fallows.

The month of September is the best for sowing; after which, the first fortnight in October, But a gravelly loam will thrive with late sowing better than most. From the first fortnight in October, till April, the time is totally improper for sowing; and the later, the worse: No reparation can be made by additional ploughing in this circumstance.

It is to be noted, that early sowing is not so proper on clover, as fallow land: And, where ploughing is delayed till after barley sowing, an early crop may be lost.

Wheat may be sowed after a crop of pulse of any kind, such as beans, &c. with greater advantage than after a fallow, as will be exemplified in another place, provided it has good management during a course of years. Potatoes, particularly, leave the land, when ploughed, extremely much meliorated and well pulverized, which is a very desirable state for a crop of wheat, or any other kind of grain.

Good husbandry is considered as a grand mean to preserve wheat from distempers; and, at the same time, to make it weighty and good. The use of burnt, thin or shrivelled seed, is to be avoided, as they have produced smutty corn; the latter, particularly, on soils not properly prepared.

Generally, rich, gravelly loams, fine turnip and barley lands, are found to affect crops with mildew. Also, warm, gravelly lands, rendered uncommonly rich by the force of manure, are more subject to have mildewed wheat, than soils not equally manured; the

forcing nature of the manure, is said to cause an extravasation of the sap, which may very probably be suited to attract and retain this insect. If one kind of wheat be mildewed through the centre of a field of a different sort, which has escaped; this is supposed to happen from the admission of a current of air; which, as it brings nourishment to the plants, may certainly bring a large portion of those particles and insects with which the air is charged. For this reason corn cultivated in rows is more apt to be mildewed than in the broad-cast mode; which lays the drilled husbandry under a great disadvantage, as before observed.

The granary where corn is preserved, must have its openings to the north or east, and vent holes at top.—The corn is to be well dried and cleaned; and well stirred every fifteen days for the first six months; afterward, it will be sufficient to sift it once a month: at the end of two years it heats no more, nor is there any thing to fear, but from the air and foreign moisture.

2. R Y E.

RYE is to be prepared for, sifted, and sown, in the same time and manner as wheat.—Loamy, gravelly, sandy, and dry soils, are proper to the nature of it.

Dry weather is to be chosen for sowing this seed; because, by lying in the ground a short time before it is wetted with rain, it is prepared for vegetation, which then goes on gradually, and produces a more regular, certain crop, than when rain falls on the seed soon after it is deposited in the earth.—This is to be observed in sowing for every kind of vegetables, except those which delight in moist grounds and seasons.

Good ploughing and manuring must be had for rye; the former, to render land fit for sowing and harrowing, so that the seeds may easily obtain a depth of earth for covering and securing them from frosts, cold winds, wets and droughts, which damage them; and the latter, to
preserve

preserve seeds from the preying of worms and insects, and to nourish and promote the growth of the plants.

By sowing rye in September, the seeds have time to branch and disperse their roots under cover against winter, injurious weather, grubs, &c. which attack their infant shoots, when sown late in October, to their great prejudice.

The stiff soils require two bushels and a half; the lighter, two bushels of seed, for each acre.

The seed is to be drilled in three rows, eight or twelve inches asunder; and the earth, in the intervals occasioned by the rows, being kept loose with horse hoeing, may be reversed for sowing next year, and alternately changed for this produce, without the intervention of a fallow. The interval for horse hoeing may be thirty inches.

The operation of horse hoeing must be given in this cultivation; the weeds are of so rapid and large a growth, as to bear too hard for hand hoeing alone.

3. B A R L E Y.

IN the production of grain, a cultivator should know precisely what crops are most fitted to every soil, as the difference is very great from the same expence of preparation; as for instance, in moist and wet soils, unless the management be very complete and masterly, a barley crop is, by far, the most uncertain that can be cultivated. Or, if the farmer expect his advantage from the product of barley alone, and the land be poor and out of heart, it ought, in reason, to precede a fallowed crop.

Land must, by good tillage, be brought into clean order, that the product may be in proportion to the manure; for if it be not well pulverized and cleared from the weeds, the manure will only dispose the crop to mildew and ruin.—But a farmer ought to be provided with manure of his own raising; since his losses will often enough bring his profits under *par*, without
having

having his expenditures increased in the purchasing of manure.

Rich culture should be given to crops of pulse, such are peas, &c. as a preparation for those of grain, viz. barley, &c. because the nature of the former bears the utmost strength of manure, without hurt or damage; they also take off the rankness of large quantities of it, by the culture and strong vegetation necessary to their growth; and by mixing the manure with the soil, prepare it in a most serviceable manner for plants which receive nourishment more subtilized, or not so grossly. Wherefore, manure does not succeed, if applied at first to crops either of barley or oats.

Thus, horse-hoed turnips are found a good preparation for barley broad cast; especially if the turnips are fed off with sheep. So are cabbages, which being completely cultivated, cover the ground almost to the intire exclusion of the air, and thereby causing a putrid fermentation in the soil, become inconceivably beneficial to it. Potatoes are considered as an admirable sweetener, which wonderfully prepares the soil for corn; they draw the virtue of the dung in rich manuring, so as only to deprive it of its violence, while they escape without the least detriment, as observed of pulse in general above.

Tillage and manuring must go hand in hand, in securing a good crop; and judicious husbandry always considers them inseparable, and intitled to the strictest observance. For, unless there is extraordinary tillage, the most advantageous course of husbandry will not yield good crops; nor will the utmost efforts of tillage procure, at any time, a capital crop, to which manure is indispensably necessary.

The profit of excellent husbandry consists not always in the first crop, but in having the manuring so richly incorporated with the soil, as to insure a farmer a crop, whatever he sow, without the expence of a fallow, or fresh manuring. Hence, the crops of barley, after manured turnips, are full as good as those for which the manuring

manuring has been directly laid, and when the turnips are fed off with sheep, much better.

Barley is no profitable produce by the drill culture; the weakness of the stalks interrupts the operation of horse hoeing, and occasions considerable loss; and the drilling in equally distant rows for hand hoeing, is vastly inferior to the common husbandry.

The common broad-cast method of sowing is the only generally successful one for barley; for therein, the manure is only an inch or two from the centre of each root of the plant. Now it is a material circumstance, that the distant roots receive a sufficient quantity of nourishment to make a manuring answer in the crop; and this being generally found in the common mode, and but rarely in the horse-hoeing culture of barley, the former claims the preference in a high degree.

Barley is best sown on land that is in excellent order, clean from weeds, and well manured; in which case, immense crops arise.

The greatest crops of barley gained in England, are on clay soils, well drained, that have a year's fallow, are ridged up in October, the manure carried on the first hard frost, and ploughed and sown as soon as the earliest spring earth is dry enough; whether at the end of February, or in the first fortnight in March. But, independent of the above advantages, a gravel loam yields a greater product of barley than a clay soil.

Spring tillage is beneficial for barley; the additional expence of a ploughing, will produce a large increase of the grain in a crop.

The stubble of wheat corn, whenever ploughed up, is improper for sowing either barley or oats.

The steeping of barley for seed, is found to be of no consequence.

Good common seeds for barley rank high: those which are bad, are equal in quantity, but not in value.

Seed barley should be raised on a different soil from that on which it is intended to be sown; that is, if you sow on clay or loam, your seed is to be chosen from sandy or gravelly

gravelly soils, and by contraries. The smallest product is from barley raised in the same field.

The fullest, weightiest and brightest grain for feed answers best; neither distance of place for its former growth, nor the smallness of size, are equal grounds for the choice of it, the latter of which is esteemed for furnishing the bushel with greater numbers.

Clayey and gravelly loams have four or five bushels of seed to an acre; other soils have various quantities, according to the state of their manurage, from three to seven bushels. The product will vary with the same cause, from four to eight or nine quarters on each acre.

Barley seed is to be put into the ground towards the latter end of February, if the soil be then ploughable without fear of poaching; as also if the soil be a dry, crumbling clay; or dry gravel, sandy loam, &c. that will admit ploughing all the winter; because in these circumstances, with early sowing, it produces most profitably. It may, from the above period, be sown till the commencement of June, but never later.

Snow and bad weather after early sowing (except severe, sharp frosts, without snow) are of no detrimental consequences.

If your intention be to sow in February or March, the land must have its tillage before that time. It is by all means necessary to plough and sow immediately following in the spring; that is, not to give preparatory spring ploughings; for a soil that is in the least apt to be moist, after receiving one or two spring ploughings, becomes a mere muddy consistence, with every shower of rain; and is worse for a higher degree of pulverization. The farmer therefore has the best chance for a dry stirring the first; for rains, which would afterwards make the soil poach, will, before it is stirred, have no such effect. If a farmer be caught with rains in spring preparations for barley, the consequences are late sowing, and a poor crop.

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The leaving the field in stubble all winter (for the consideration of feeding of sheep), delaying the tillage till spring, and sowing late which follows unavoidably, is a practice highly prejudicial to the interest of a farmer.

Mildew in barley proceeds from a rankness of growth.

4. O A T S.

THIS produce must be sown on land in excellent heart, or it will not answer the expence of cultivation.

Though oats are not equal in importance to either wheat or barley, yet, from the quantity consumed by horses in this kingdom, it necessarily becomes a frequent crop with farmers: it should, however, on the above consideration, be more limited; and no more land occupied in its growth, than a farmer can completely manage, thorough tillage and manuring being the only direct means of obtaining his expectations of a profitable product of oats.

The thorough manuring for turnips, is attended with a large product of that useful root, and operates advantageously for good crops of this produce; besides which, it leaves the land, after them, in proper state for those crops which are to succeed.

Oats may yield two crops, with turnips, where these are easily produced, without an intervention of a fallow, or fallow crop, provided the land be well cleaned after the turnips.

The sowing of oats, after wheat (which is called cross cropping of land), without additional culture, will appear to be husbandry of the worst kind.

The culture of oats in drills, does not advance its product.

If the product of oats be less than four or five quarters on each acre, a farmer will reap no compensation for his labor and expence; he would, therefore, do better to dispose of his land otherwise, and buy such quantity of oats as the feeding of his cattle may require.

About seven bushels of seed are usual for each acre; if the quantity be much inferior or superior, the event generally proves less beneficial, notwithstanding what is maintained and insisted on to the contrary.

The state of the soil is more particularly to determine the season for sowing oats; if the land admit, the most approved time for this purpose includes a period of three weeks, viz. towards the end of February and commencement of March; but if the weather be wet in March, an April seed time may be preferred, with good reason.

Black oats produce best in wet seasons, and they will endure to be sown earlier than white; however, in general, both kinds produce best with early sowing.

5. B U C K W H E A T.

THE produce of this kind of grain is in unreasonable disesteem in many parts of England; for, without doubt, it is an important object in husbandry.

This cultivation may be carried on to good advantage with a light, gravelly loam; and will succeed where land is neither so clean, nor in heart sufficient either for barley or oats. It repays a rich soil; the returns being very profitable in this case: but it is a wide departure from matter of fact, to assert, that it thrives only on poor lands.

Buckwheat is of a tender nature, and therefore must not be sown till the middle or latter end of June; on which account, if the season have been so unfavorable as to prevent sowing barley or oats in the proper time, this may, with propriety and benefit, be substituted. It generally is found to answer as well as any common crop, and is superior to a crop of barley late sown.

The quantity of seed for an acre is seldom more than two bushels, whereof the product is various from four to nine quarters.

Buckwheat is used in some of the northern counties, when mixed with a better sort of meal, for bread; but its more general application is to feed hogs and poultry.

C H A P.

C H A P. II.

VETCHES or PULSE.

I. P E A S.

THE pea is a tender vegetable, that will not admit of rough usage, in the least degree, while growing; and, more than all other pulse, depends on the season. Wet is hurtful to it. The soaking of seed for peas proves destructive; but it must be sifted, as directed for wheat seed, &c.

It is scarce ever sown on land prepared as for barley or wheat; either of those grains being deemed more profitable in their returns for the necessary expences. Notwithstanding, peas have been found to pay that advantage, as well as most other crops; and the greater the attention with which they are prepared for, without doubt, the greater will the crop be.

A light, and gravelly land is best for producing white peas; but brick-earth loams or clays, may afford very good crops of the other sorts of this species of pulse. The hog pea delights in a strong soil.

Four bushels and a half are the best quantity of seed for an acre; upon which the product may rise to two or three quarters. The same quantity answers for the several sorts of this plant; and any under portion of seed, must exclude more than an equality of profit on the product. The seed of this cultivation must be plentifully sowed, as pigeons, &c. will carry off much of it, to the lessening of the crop. Sowing may be continued all the month of April.

Peas do not exhaust the soil like grain; and therefore any other crop will likely be more successful after them than after grain, other circumstances being the same.

In drilling this produce, a farmer is to depend rather on many than a few rows, which are to be equally distant. When drilled in equally distant rows for horse

hoeing alone, it thrives incomparably well, and exceeds the broad-cast mode; as the opportunity of hand hoeing one-foot rows in the former, if well done when peas are from five to seven inches high, is effectual to checking and restraining the weeds in a degree that cannot be obtained in the latter. But a good crop of broad-cast peas leaves the ground as fit for a future crop, as the best of drilled ones.

A horse-hoed crop of this pulse has no advantage over one that is broad-cast, or in equally distant rows, for mellowing or loosening the soil, though such an opinion obtains; for, in the operation of horse hoeing, the crop loses the benefit of much shade, which naturally pulverizes and enriches the land. This, on the contrary, forms one objection to the last mode of culture; and it may be added, that it obviously incurs a loss of ground; from which considerations, the practice is deemed inconsistent with the intentions of saving husbandry.

Supporting peas upon sticks, answers that application, by yielding most advantageously with it. The tendrils then are borne erect, which otherwise trail, and become damaged in the culture, that, in some modes, is necessary almost all the time of their growth. Besides, the keeping them erect, gives the sun and air admission to the lower parts of the plants, which increase their produce, and render it of a better quality.—The beauty and utility of the drill husbandry, is seen to greater perfection in vegetables that support themselves erect from their infancy to the latest growth.

Good husbandry is a just ground of expectation in this produce; but care is to be taken, for a great expence of culture will endanger a certain luxuriance of growth that will prove detrimental. Bad seasons are most severely felt, on badly-managed lands; and therefore the improved culture (which is common practice spiritedly exerted) is recommended, as many ways more commodious; such as leaving the lands in excellent condition, producing a return of ten pounds from one acre, where a like was scarcely obtained from ten, &c.
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The husbandry which thoroughly clears the soil, and leaves it in a crumbling state, increases weeds at the same time; for the finer the land, the more they abound.

2. B E A N S.

TO acquire considerable profit on raising beans, they must be made a fallow crop for wheat or barley; and the product of wheat after beans that have been well hand hoed, evincing that it is equivalent to a fallow crop, indisputably proves the utility and success of the practice.

But such intention follows the drill and horse-hoeing culture best; wherein, the ample manurings, the operations of horse hoeing, and the benefit of the tillage (if performed in three rows, on five-feet ridges), largely promote the growth of this kind of pulse, and after a crop of it, leave the soil rich and perfectly fit for an advantageous product of wheat, without a fallow year.—The idea of this husbandry being expensive, is erroneous, and ill-founded.

Beans have a strength of stalk, which supports them without danger from horse or hand hoeing, on which account they succeed with the drill husbandry and horse hoeing, better than any kind of corn or pulse; and being capable of tillage to a great degree in rows and intervals, are far superior in this mode, than by the most improved methods of common culture. Because, with horse hoeing, the land is excellently cleared from weeds, and the soil becomes so fine and separable, that the roots extend with ease into the loose mould in the distances, and thereby derive a larger supply of nourishment; which makes the beans to shoot out with uncommon vigor, and yield pods not only more numerous, but better filled. A crop of beans must, however, receive hand hoeing, for the land becomes worthless, and in absolute need of a fallow with the want of it: but horse-hoeing is the grand course for clearing it
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from weeds, and rendering it fit for wheat; when, a clean and advantageous crop of that produce ensues.

The drill and horse-hoeing culture is suitable to the nature of this vegetable; it kids the beans lower, and fills the stalks and pods in a manner superior to that of the broad cast.—Hence it is unaccountable, how prejudice should hinder a general adoption of the former. Also, by the drill culture, where the beans have space to grow and branch in, with repeated horse and hand hoeings, a soil receives great advantages for this produce.

Land in good heart may be drilled in equally distant rows at two feet asunder; but such as are more impoverished, must be relieved by three-feet rows.

Beans in proper intervals are capable of very complete husbandry, and afford ample means of freeing the soil from weeds and obstructions accruing with the growth of wheat, they therefore become a preferable cultivation, unless the wheat succeeds beans that have had good tillage and manuring.

Cutting off the tops of the stalks of beans to about eight inches, when they begin to blossom, is indispensable, and easily practised in drill crops.

This produce, which is sown early in the year, derives a certain increase from a ploughing in September or October. The soil being exposed to the frost, does benefit to the plants, and by bringing them forward for hand hoeing, preserves them from the damage of seed weeds, which abound in the spring.

The quantity of seed for beans (which is to be sifted, but not soaked) may be about two pounds per acre; for being sown plentifully, they produce in proportion. But the grand point, is, in managing the hand hoes in cutting up many or few of the beans.

The greatest product is from the light-colored tick bean; and sowing beans on land richly prepared, is of vast consequence in their producing profitably.

The time of sowing is towards the middle of February, which may continue till about the middle of March;

March; but after this, the season for successful sowing is dubious: The latter end of March and beginning of April are observed to bring comparatively poor crops, in spite of every exertion tendered to prevent the evil of late sowing.

Four quarters on an acre, in dry seasons, are deemed no bad crop; good crops are reckoned from seven to ten quarters, but the soil must be favorable in these cases.

Wet soils, if well manured, answer for this produce; and clay and gravel loams require more than common culture for it. Loose land is by no means improper for beans, if it be rich and good.

Beans require good treatment; and much dunging is necessary for them. But a little extra ploughing, and hand hoeing at six-inch distances (in the common method), is a good culture for clearing the weeds, giving vigor to the plant, and increase to the product.

If beans are sown in the common husbandry on soils not light enough for turnips, they produce advantageously. And such a crop, if well hoed and manured, mellows the land, and leaves no necessity for a fallow after it.

3. T A R E S.

THIS cultivation is extremely various in divers places; being sometimes raised for seed, at other times for feeding, and most of all for hay. It will, however, on land that is good, or well manured, answer every expence, and yield a handsome profit besides.

A farmer should consider, primarily, in the cultivation of tares, the consequence of raising large quantities of hay in that grand article of husbandry, the keeping of cattle; for if he begin grazing on turnips, as cattle must not feed intirely on this root, a large stock of hay will be requisite for them: and if he have no cattle, he should buy them in; for that which improves a farm most, is raising much food for cattle, and feeding them

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at home on it. But to let a crop stand for seed to sell at market, instead of feeding and raising capital stocks of cattle with the hay of it, is perfect losing, and what every good farmer avoids.

Tare hay is a good food for cattle; and preferable to every thing for oxen that are fatted with turnips, as a variation or help in their diet: Their racks being filled with this hay, will cause them to eat more turnips, and to fatten, almost, infinitely faster. Horses thrive better on tare hay, than on any meadow or pasture hay whatever. Sheep take to it, with turnips; and tare hay never gripes them, when thus eaten. All young cattle advance and thrive with feeding on it.

A great mistake in the present agriculture, seems to be the endeavoring to raise such products as will sell at market for money; and these, being chiefly expensive in the necessary manuring, &c. keep those farmers low, who are already poor in circumstances; whereas, could they be prevailed on to reverse their conduct, and produce more for the purpose of raising and feeding of cattle, they would, in all probability, sooner be able to purchase great stocks of them, and be less confined in their notions of advantageous husbandry, as well as their pockets.

Sowing tares for hay, in such fields as do not insure very good crops of barley and oats, will ever be customary with understanding and saving husbandmen.

The advantages resulting from tares well manured and sown for hay, are many and obviously great: The land is cleaned, and fit for any other crops; the numerous weeds brought up by the dung, being completely destroyed by the luxuriant growth of the tares; and the soil, partaking of the dung in this produce more than with corn (which exhausts the virtue of it almost as soon as laid on the land), becomes in extreme good order for such crops as will neither kill the weeds themselves, nor admit of culture necessary for their destruction. Hence, wheat or barley succeeds tares on a soil thus prepared, better than when the manure is purposely laid for either.

Oats

Oats may follow tares with a proportional profit. The grain in this order is very clean; the husbandry, therefore, is intitled to the preference on a comparison with other forms or modes.

Laying the manure on land so as it may not be rendered foul by weeds, should be the aim of every farmer. If wheat be to follow tares, let the manure designed for it be laid on the tare fields, and the wheat be sown on the tare stubble; the event will be a clean crop, and the intention, above pointed at, effected.

Tares answer in proportion to the goodness of the soil and manure bestowed for them. The larger the crop, the better for that which succeeds; as the fertilization promoted by the shadiness of a large crop, gives to the land every advantage of a fallow.

A thick crop of tare hay prepares better for a crop of wheat, or barley, than a fallow, though this consists of a year's tillage; and the tare fallow will break up for barley and clover, finer in the tilth, than the tillage one. But, further; as a considerable portion of dung follows the feeding of stocks of cattle on tare hay, if a quantity of it be spread on the land, the growth of barley and clover on the tare land, so manured, will have a manifest superiority in its favor, to that produced by the fallow unmanured; from whence this practice appears to be very beneficial.

The time of sowing is March; and the usual quantity of seed is three bushels to an acre: However, less serves, if the land be in good state of preparation. The profit on a crop of tare hay, often rises above that of a corn crop.

Coal ashes are improper in manuring for tares.

Though land is more exhausted, and the expences are higher with tares than a crop of spring corn, the profit on a crop of the former greatly exceeds that of the latter; and where there is not sufficient meadow or pasture land to a farm, the utility of this produce is very much enhanced; especially, if the hay be scarce or dear, or the farmer abound in cattle.

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Tares,

Tares, if substituted for hay, instead of after crops of corn, are advantageous in the product.

Tare hay may relieve land by being raised in the room of clover; and tares for hay are preferable to crops of barley and oats, that are sown without clover; but as tares will not do instead of clover, so much barley must be sown as will answer to the annual and necessary quantity of clover.

It is frequent among farmers to sow wheat after seed crops of tares or peas, though not after barley; but they must know, that, by mowing the tares for hay in their highest state of succulency, that is, ere the seed is formed, a more preferable state of soil is left for the grain.

Leaving the land in stubble and unploughed till spring, when it should be ploughed in autumn for this produce, is, to all intents and purposes, a bad conduct.

4. RAPE OR COLE SEED.

RAPE is sown to best advantage near the water, or on fen or marsh land; and any land that is not in good heart or condition for corn, may be rendered better for that kind of produce, by being several times previously cropped with this plant. Its principal use is for making oil. However, the growth is appropriated for feeding milch cows, ewes and sows, and for fattening dry cattle, such as sheep, deer, &c. also for feeding geese, ducks, pheasants, bustards, and turkeys; and for felling, as boiling herbs.

If rape be sown for seed only, it continues on the ground till May. It is now grown up, and become brown; and must be reaped as wheat, and laid, by handfals, in bundles, for about a fortnight, during which time, it is neither to be touched nor turned, for fear of spilling the seed. At the end of the fortnight, if the weather have been favorable in drying it, gather it in a sheet, or sail cloth, for the better preserving the seed, and carry it into the barn for threshing. If it be
threshed

threshed in the field, the number of hands must be increased, in order that the rain may not interrupt the business. The profit is forty shillings or three pounds on each acre; and the seed increases in price according to the extensiveness of the crop. When the seed is off the ground, sheep may be fattened on the remaining edible part of the crop.

The preparation for rape is good ploughing and manuring, whether the land be dry or wet, or the produce designed to be by drilling or broad cast. Heavy, wet soils, for the latter, must be well pulverized and mixed with manure; and a gallon of seed, at Midsummer, sown on each acre.

The seed for this cultivation is to be carefully chosen; the largest is said to be the best, and that imported from Holland is in the greatest esteem; it must be mixed with fine earth or light sand, to prevent its growing in clusters. But the plants must be hoed, to produce advantageously.

Dry, gravel, or sandy loam, if prepared for drilled rape by good dunging and ploughing, will be well occupied. This husbandry provides for hoeing in a most desirable manner, which (as just observed) is very material in this crop, and must be given in due time.

Horse hoeing rape or cole seed gives a better assurance of a large product, at the same time that it clears the ground of weeds, and renders it fit for any spring crop. Seed is sown, in this mode, in July, August, or September; and would succeed to admiration, if covered with a manure, in the same method as pointed out for hemp and flax.

5. H E M P.

THE land, for this produce, is to be laid with manure, which is to be harrowed in, well mixed, and rendered very fine, before the seed is sown.

Hemp agrees with any loam; and, when sown in drills, with a covering of manure, and a loose ridge of earth,

earth, the seed is secured from being the spoil of winged robbers, and the growth of the plant is nourished to its highest state of perfection. A plough contrived for sowing the seed, and manure directly on it, is the best for this cultivation.

Weeds are prodigious enemies to a hemp crop; and though they cannot be destroyed totally in the broad-cast method of sowing, by the greatest endeavors or exertions, drilling and the consequent easy hoeing, clear it of these hindrances, and greatly enhance the value of it to a farmer.

The beginning of April is the sowing time; and three bushels are the quantity of seed for an acre, for the broad cast, which must be harrowed in. Two bushels are sufficient for the drilled, if the rows are at twelve inches distance; but more will be requisite, if they are six or eight inches asunder.

The time of drawing what is ripe for the summer, is the beginning of August; but if it stand till Michaelmas, stems grow off the hemp like a little coppice, from whence may be obtained a great increase of seed. In drawing these crops, great care is to be used to pull them gently out of the earth, and not to break any, as what are broken are spoiled. The latter drawing is to be bound in bundles, which are called yard hands, and stocked in a barn, or other dry place. It is to be threshed for the seed; and afterwards peeled, to sell rough, when it is again tied in bundles. One acre of hemp is worth from five to eight pounds.

6. F L A X.

FLAX lands require the same preparation and husbandry as corn; in ploughing, sowing and weeding.

On a loamy soil, which has been ploughed fine and well dressed, the seed may be sown broad cast, and harrowed in, which is all the old husbandry requires. In the new husbandry, it may be drilled as hemp, in rows, leaving intervals for horse and hand hoeing, which destroy

stroy the weeds, and cause this useful vegetable to thrive more successfully.

February, March and April are severally chosen for sowing this seed; of which two bushels are necessary for an acre broad cast, one or one and a half for an acre drilled. A cold situation agrees best with late sowing.

The crop is to grow till it is full ripe; when they draw and tie it in handfals, setting them one against another till perfectly dry; they are then deposited in the barn, for sale or private use.

7. W E L D o r W O U L D.

THE culture of weld is profitable. It grows upon the poorest land, if light and dry, with little tillage and harrowing; or, it may be sown with barley and oats, with no addition of labor or expence. The manure laid as a preparation for corn, may be drawn over the seed with a brush, or the seed may be covered, when sown, with a roller.

The best seed for weld is obtained near Wye or Canterbury; and a gallon of it is the proper quantity for an acre. It must be very well mixed with sand, or light, dry earth, and sown with care and regularity, to prevent the plants from clustering.

Though it comes up with the corn, it proves of no detriment; the growth not being so strong the first crop, as to prejudice the corn in point of nourishment. But when the corn is cut, be careful to preserve this; which will ensure you a good crop the ensuing summer. Watch the ripening of it: for if the crop be full ripe, you will scatter and lose some of the seed; and if it be not ripe enough, the seed will be imperfect, as well as the stalk. When the seed and stalk have arrived at their perfection of growth, they are to be pulled, in the manner of flax, by the roots, bound in handfals, and set to dry. The parcels are afterwards to be laid up in some dry place or out house, till sold to the dyers, who have great demands for this produce, and will often pay a
good

good price for it. The returns of profit on this article of husbandry, are from three to twelve pounds an acre.

The seed is sometimes kept till March, and sold separately, at about ten shillings a bushel. The root and stalk are sold together, for the purpose of dying the bright yellow color, &c. by the ton or hundred weight.

But turnip, rape, and weld seed may be sown broadcast together, and, being harrowed, left without hoeing; because, if the turnips and rapes are hoed, it spoils the growth of the weld: and when in winter or spring, the turnips or rapes are eaten off, by sheep, the weld will grow very fast by their tread, dung and urine, and be fit for reaping in June following.

There is no doubt of weld paying expences handsomely, if chalk, gravel, or other dry soils were prepared for it as for drilled wheat, and the seed drilled in the manner of that grain, about Michaelmas. The growths are similar, and the plants require a like strong nourishment from the soil; probably, therefore, with this management, the crop would greatly increase in value.

C H A P. III.

R O O T S.

I. T U R N I P S.

IN the culture of roots, the soil advances in fertility, by the abundant attention necessarily given them while growing; which cleans, mellows, and prepares it for crops of grain.

A judicious, experimental choice in the succession of crops is of the last importance in husbandry; and as an improvement in the course of his cultivation is the ardent wish of every farmer, the undermentioned, having been found excellent, are accordingly submitted as worthy
his

his preference.—Turnips, barley, clover, wheat, on gravel; drilled beans, broad-cast barley, clover, wheat, on clay.

Crops of turnips ensure manure, by stall fattening, or feeding on the land, which is of great consequence in the promotion of the growth of this root, and cleansing the product of succeeding crops; and, therefore, this cultivation is mainly answered in manuring and cleansing the farm.

It is difficult to draw the line of disparity between the different modes for the culture of turnips.—Those who prefer the drilling will make use of horse hoeing, as well as hoeing with the hand, as it greatly enlarges the size of the root. The product of treble rows on five feet ridges, exceeds all other methods in this husbandry, and their being richer and cleaner, are the only instances in which they have the superiority over the broad cast. The manure, being laid upon turnip land in good tillage, encourages the seeds of all weeds to grow, which are intirely destroyed by the culture in the drilling method; but the opportunity is not so fair in the common husbandry, consequently, their destruction can be only partially effected; and the result is, the drilled crop is richer and cleaner for the manure, which is allowed an object of some importance.—But this appears to be an expensive species of agriculture.

The broad-cast method is more generally to be relied on for advantageous and profitable crops, especially with three hand hoeings; because the ground is then covered by the roots to a far greater amount, which yield near upon an equality, both as to number and size, with the best drilled crops.

The saving the expence of a fallow, and the raising manure by wintering so many more cattle than could be kept without them, are the great advantages of the turnip culture; and, therefore, the immediate profit on crops of turnips is never separately to be considered, but in connection with the preparation their manuring occasions for after crops.

Turnips

Turnips may have, for their preparation, four or five ploughings, and three or four harrowings. It is extremely necessary, that all crops should have land rendered sufficiently fine with numerous earthings; so that, covering good tillage and preparation, every season which offers may give some advantageous influence. The pasture roller is a very good expedient, to break the clods of earth, and perform pulverization for turnips, when difficult, or in dry weather.

Trench ploughing, to ten inches, succeeds well with turnips, especially on a gravelly loam. But this kind of ploughing for soils that are cropped with corn, chiefly, is objected to, as bringing up a depth of earth too new and sour for the nourishment of these plants; granted; yet, turnips and cabbages are greatly benefitted with it, and, in two or three turnings, the trench-ploughed land becomes rectified, and equally good with the other parts of the soil, for wheat, &c.

Manure is not always required for this produce on land that is sound, and of good fertility; but manured crops do greatly exceed the unmanured, and are an instance that dunging promotes the growth of turnips.

Ample manuring, and proportionate tillage, assist successfully in producing this root, which with treble hand hoeing (in the broad-cast method), and the thickness of the shade of these crops, have further great use in preparing for, and insuring large products of barley, &c. in the courses just proposed.

Too much fresh hog dung is a hurtful dressing for this produce; but it may be used, if qualified with a like quantity of farm-yard dung.

The driest and soundest soils agree best with turnips; and these crops are generally very good. If this root be raised on very dry land, it is best fed off; but on wet soils, they are usually drawn, and the cattle fed with them in the farm yard, or in a dry pasture: The last is, upon the whole, the more profitable appropriation of the crop.

Turnips

Turnips may be raised, with tolerable good success, on wet, clayey loams, where rich manuring is afforded; and the turnips will neither be ill-tasted, nor sticky. But these cannot be fed off; and in carting them, unless fine, dry weather be chosen for the work, the land will poach, and the future crops receive detriment. In short, wet lands bring better crops of beans.

The culture of turnips is absolutely necessary for the winter maintenance of cattle; and upon providing plenty of winter food depends, materially, the prosperity of a farmer.

Turnips sown, where a farmer is in want of cattle, without view of a fair price from a neighbor to feed them off the ground, tends more to hurt than profit; and so does the practice of letting them stand for seed; and these should, therefore, be alike avoided.

The felling of turnips to be eaten off the land by sheep, for a tolerable price, may answer; but where this cannot be done, beasts must be bought, and stalled on them, to make the produce yield profitably. By using vegetables largely in feeding cattle, great quantities of manure are obtained; which increases every crop, and makes a farmer rich.

In profitable stall-feeding on turnips, so many beasts should be had to fatten as will employ a man constantly in carting and giving them, and in cleaning and littering the cattle: The roots may be drawn, and cleared of the earth, tops, and tap roots, in the field, and then laid in regular rows; when thus prepared, they may be loaded off, into a small cart for the purpose, according to the quantity consumed every day, in a short time. And it is to be observed, that the benefits of manure raised by turnip feeding in the yard, will be much diminished, where a sufficiency of straw and stubble is not provided for littering and keeping the beasts clean, which will require to be done twice a day, at least, if proper attention be paid to interest in raising manure of this kind.

In fattening of cattle, an acre of turnips will yield manure enough for itself; so that great improvement, and the bringing of land into heart, are none of the least serviceable purposes of the turnip culture; this, while the fallow neither yields dung, nor makes any kind of return, will certainly gain the attention of some who have, to bad purpose, adhered to the unprofitable, fallow practice.

Double cropping such soils as are good, with corn sometimes, and at other times preferring the fields, which would yield turnips in abundance, for summer fallows, are notoriously wrong. A large cultivation of this root, in order for feeding by stall or in the field, with one's own cattle, is a more profitable disposition: This might oftener, and more easily take place, were not the generality of husbandmen over stocked with land.

Middling sized beasts will fatten in four months; and November, December, January and February, being the months in which turnips are in their highest state of perfection, are proper for the purpose.

Barley is the crop usually succeeding turnips; and is better after them, if fed off by sheep, than after a fallow. But the barley will be good, if the turnips are drawn, provided they had a manuring; in which case, it will also be clean. This, as before observed, is caused by the great tillage, and double or treble hand hoeing necessary for this root.

When barley with clover succeed turnips (which is a general rule, except where wheat can be sown after them in a proper season), a great crop of barley is not the only advantage in prospect, the land being laid for grasses when it is in good preparation for them, that is, soon after manuring.

Clover does not exhaust the soil, but adds to it. The soil, being nobly shaded by the thickness of the crop, together with the manure lodged in it, derives an increase of fertility while the crop remains on the land. The wheat, therefore, being deposited on the clover stubble

stubble while the land is in a state of fertilization so proper for it, cannot fail of a capital product; and the soil will be left after it, in such condition, that the farmer may expect a good crop of turnips from the virtue then remaining in the land being communicated to them.

And thus, turnip crops, as well as others, being conducted with preciseness and deliberate estimation, become securedly beneficial, and greatly capable, in a course of time, to elude the injuries of bad seasons and accidents.

June is the most proper season for sowing turnips. The quantity of seed for an acre is about two pounds.

The fly is a great impediment to the desirable growth of this produce, which has no remedy like that of the young plants growing a race (as it is called) with the insects; by this mean, the plants generally get into the rough leaf, and find a resource against their destructive power. Rich manuring sometimes forces the growth of a crop so fast, that it escapes the fly.

To prevent the fly, strew foot, or coal ashes, on the turnips, in an early state, by way of manure.

Turnips, fed on by milch cows without other food, gives that disagreeable taste complained of in turnip butter; but three parts of hay, with one of turnips, is a food, in which this produce will be unattended with the above effect.

2. C A R R O T S.

THE carrot culture is not only exceedingly more profitable than that of turnips, but prepares better for crops of barley, clover, and wheat, than they do; because the tillage being equal, the hoeing and cleaning more effectual, and the branchings of the carrots thicker than those of the turnips, the soil must, therewith, be enriched to a greater degree. Again, the crop may be cleared off the land time enough for an autumn ploughing for the winter, and the land left free from many

injuries consequent on going on to it in a wet season; with which, it is so well ordered, as to be, in fineness, equal, and in many respects superior, to summer-fallow land laid up for barley.

The culture for carrots, is, a trench ploughing, with two common ploughings, three harrowings, and three hand hoeings. All which expences, with that of seed, at about four shillings per acre, and twenty loads of dung, digging, carting, &c. are repaid, and a clear profit of fifteen or twenty pounds a year, for a succession of years, may be gained, on each acre, by a persevering continuance in this husbandry; besides, a prospect of the land's deriving great advantages of fertility, and being well prepared, at any time, for a change of crop.

March is the most proper season for sowing for this root.

Carrots require much manure, which must be purchased for them, unless the farmer is provided with it from stall, or farm yard feeding, which is worth the invariable attention and aim of a farmer, as being the best of all methods for furnishing himself with so necessary an article.

The profit, by manuring for this produce, is very much advanced.

In manuring the land for carrots, and cleaning the crops, according to the expence, the profit will be; and if the expences are adduced *against* the raising them, the profit, almost infinitely exceeding that of other crops, will defend me in the commendation and preference herein recited *for* it.

Carrots, if sown successively on the same land, with a manuring at proper intervals, will increase in the produce, and recommend their cultivation very much to a farmer. But when the crops, at first, are much infested by weeds, they must be well cleaned and properly hoed, without which they will be ruined. The weeds come up very thick in some instances, but if these are industriously cleaned, the produce will come on favorably, and yield, equal to the expence, with the appendage of
a large

a large profit. The culture of a first crop, reduces the weeds much, so that the expence of cleaning a second is small, and a third still less. Thus, this cultivation keeps the land in excellent tillage and preparation, almost intirely free from weeds, and productive of extraordinary profit.

A deep, rich, sandy soil, is most suitable to the growth of this root; which may be improved to very great account, if followed with the culture proper and necessary for it.

But, carrots succeed better on clayey loams, though wet and heavy (which are unfavorable), than turnips; the profit on the former, after all expences, being very considerable; whereas, a crop of turnips, intended as a fallow, has a certain loss on each acre cultivated with them.

The consumption of carrots, by stall feeding, turns to the amount of double the quantity of manure they require for an acre; and the crop, at the same time it enriches the farm so amazingly by a production of manure, cleanses the land in due proportion, with the accurate culture it receives while in the ground.

This root washed, chopped in pieces, and given in chaff, is used as a saving food for horses, especially in Derbyshire; but oats must now and then be given them besides. They also serve admirably for fattening oxen and hogs; for feeding cows, young cattle, and sows and pigs. Swine are, in general, fed with the tops; but the root boiled, mashed, and mixed with bran, is, likewise, a good food for them.

Cows, fed on carrots, yield a perfectly sweet and good milk, which is deemed better than the common, and more in quantity, than when fed only on hay. Cows are, also, sooner fatted with carrots than with turnips.

3. R E D B E E T S.

RED BEETS are deemed a profitable growth on clayey loams, which do not so well accord with the nature of the carrot. They

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They equally supersede a fallow year, with the profit on their being a food for swine, the raising of manure, and the preparation which their culture gives for wheat, or any exhausting crop.

The culture and expences of raising beets, is, the same as that of the carrot; excepting, that their spreading crops and difference of color distinguish them so plainly from the weeds, that they are hoed at first, with large hoes, without much difficulty.

The profit on this crop, is from eight to ten pounds on each acre cultivated as for carrots.

4. P A R S N I P S.

I shall take notice of the parsnip, as it answers the intention of a fallow, preferably to turnips. Their cultivation, feeding, &c. are the same with those for the carrot; but the profit of the carrot crop, is vastly superior, unless on very particular soils.

Cattle, in general, prefer feeding on carrots, to parsnips.

5. P O T A T O E S.

IN planting crops, of whatever kind, the primary consideration is to be, the keeping the land in a state of constant improving fertility. Thus, if the land be naturally, or artificially rich, potatoes will be a very important cultivation, and however large the crop is, if it receives equal tillage and manure, the land, accordingly, improves with it, and becomes fit for a crop which may require its fertility to be still greater.

A crop of potatoes prepares better for wheat, than turnips do for barley; the manuring for those is not inferior, the hoeing exceeds, the shade of the crop is thicker, and lasts longer; and directly on clearing this crop (such is the preparation of the land) wheat seed may be sowed, and harrowed in. This course enriches the land, besides paying all expences, and bringing a profit

profit of ten pounds (a moderate average) an acre a year; which must be incomparably better than a fallow for wheat. It even exceeds the profit of the generality of crops, those of corn not excepted; how much more must the scale turn in favor of this conduct, when the other is an idle year, which consumes the time and labor for no immediate return!

Potatoes, in general, require no more room than promiscuous or scattering crops will allow; and therefore are, beyond all doubt, more advantageous in the old method, than with horse hoeing. In the former, the roots shade the land so as to keep it looser, whence their extremities derive increasing moisture, and the product becomes enlarged and more valuable.

Dibbling, or sowing, in the old method, is performed in March. Potatoes, for this purpose, are sliced, and the slices dropped into holes made about twelve inches asunder: The quantity is rather more than twenty bushels for an acre. In the following month, the ground is to be hand hoed all over, to destroy the weeds, loosen the surface of the earth, and give the young plants liberty to come up strong, and uninjured, to their full growth.

But the horse-hoeing culture has its advantages. It effectually destroys the weeds, gives excellent tillage, and keeps the land in orderly preparation; and crops of potatoes raised with it, are superior in value to crops of corn obtained after a fallow year.

In this method, the quantity of seed is about fifteen bushels to the acre; which, if planted in three rows, at one foot asunder, with intervals of three feet, or on five-foot ridges, with three ploughings, manuring according to the soil, four horse hoeings, three hand hoeings, &c. will yield a clear profit exceeding the expences two parts in three: Yet, is inferior, after all, to the other mode.

The product of potatoes in the horse-hoeing culture, will be greater or smaller according to the number of rows in which they are sown.

Horse

Horse hoeing is not of so much importance to potatoes, as to several other crops herein mentioned. However, it assists in rendering this crop more beneficial, and prepares the land better for wheat, than a common fallow.

Dung is indispensably necessary to the growth of potatoes; nor is horse hoeing, though it be doubled, an effectual application, if substituted for it.

This produce is deemed a cheaper winter food for cows, than hay. When they have once tasted them, they feed without reluctance, and their milk, cream and butter will be of a good taste.

6. C A B B A G E S.

THIS crop is of the number which do not impoverish, but enrich a land with their culture and use; and has fair right to the title of a beneficial one. It has the recommendation of a numerous train of advantages: With a proper tillage, it pays the manuring; leaves the soil in good order, improved, and clean; sustains sheep, when they are deprived of other green food, and when their keeping is highly valuable; increases a farmer's manure, by enabling him to provide for a larger stock; and is, withal, only an exchange for a fallow year.

There is, always, with good husbandry, a clear profit on cabbages, which is not the case with turnips. And the former will yield considerable crops, on soils too wet for the latter to thrive on. Again, a dry season is rather unfavorable for turnips; and their decaying sooner than cabbages, is greatly in the favor of this cultivation.

Indifferent husbandry, on poor lands, never can be effectual for raising cabbages; but sufficient tillage, and an adequate quantity of dung, will make poor lands produce this root to profitable account.

They may be ploughed for in October, to ten or twelve inches depth, which is an acquisition to the crop not equalled by a common ploughing.

The

JERUSALEM ARTICHOKE. 49

The turnip-cabbage is deserving the highest estimation, the seed for which is to be sown in a well-dug bed in a garden, in March (the quantity half a pound for an acre), and replanted in the field in June, in rows with three-feet distances between them, and two feet between each root. The land should be ready early in June; and the planting be finished by the close of the following month, the wet times being chose for this business.

The large garden cabbage is a very advantageous produce; and answers very well where there is little turnip land to a farm; but their decay is to be considered, and the quantity raised should, therefore, not be greater than the means possessed for their consumption before the destructive season, which commences with February.

7. JERUSALEM ARTICHOKE.

A profitable cultivation certainly ought not to be rejected, on account of its being uncommon. That the Jerusalem artichoke is no common field produce, is readily acknowledged; but to its being beneficial, if so raised, something may be said: They flourish almost on any soil; and the profit of a single growth of them, on a clay loam, has been found equal to the profit of four crops of wheat on the same quantity of the above land—These are eligible objects; and the former is particularly deserving the notice of such farmers as occupy only cold, wet lands, which are totally improper for carrots, and will never bring an equally-profitable crop of potatoes.

The Jerusalem artichoke is a valuable food for hogs; and those who keep large stocks of them, may increase their number, by means of cropping this produce as a winter food for them.

The roots of this plant strike deep, and require a trench ploughing, two common ploughings, and the other appendages of vigilant husbandry. They must be

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well

well manured; and sown, or dibbled, in March in rows at two feet asunder, being sliced in the manner of potatoe seed. The quantity of seed is ten bushels for an acre.

C H A P. IV.

G R A S S E S.

I. C L O V E R.

FARMERS have, in general, rich husbandry connected with profitable crops; but in raising clover, great crops come not unseldom with cheap management.

If clover be well managed, it is a very profitable article in husbandry; and may be brought to answer the cultivation in such degree, as to exceed many, if not all other crops.

Land out of heart, poor, and full of weeds, if sown with clover, yields nothing but disappointment; and the smallest acquaintance with husbandry will not dream of cropping this produce on land in such condition.

Gravelly loams, where a choice is easy, may always be preferred, with advantage, for clover; but, in general, if land be rich, it has the prime qualification, and may be sown with it.

Rendering clover land rich, obtains its expences in a short number of years; and the improvement of the clover culture by manuring, is an object of great account with every regular husbandman.

In most instances, clover is equal to a fallow for corn; and in some, it has an undisputed superiority, particularly, on moderate sound land. And being a mean of raising large stocks of cattle, as well as producing great quantities of dung, many crops have preparation from the growth, that are likely to improve a farm, and enrich a farmer.

The

The most advantageous method of sowing clover, is, with the first crop of corn after a fallow crop, or fallow year, as it then finds and preserves the land suitable for its production. Sowing with a second crop is hazardous, and risking a loss, from the land's being too much out of heart; and, with a third crop of corn, the practice is so utterly improvident, as to bring nothing but weeds, and subject the land, in all probability, to the necessity of a fallow year. And where barley is a first crop, wheat a second, and clover reserved for a third, the course is ill husbandry, and the profit much diminished.

The stubble of clover sown with a first crop of grain on land well fallowed and cleaned from weeds, should not be ploughed for any kind of corn. Clover may again be sown upon it, without further expence, and the profit on the crop be great. Besides, the stubble of the clover is very proper for wheat after two or three years growth; and the clover, increasing in size and vigor in successive crops for three years (if the preparation was good at first), enhances the value of such crops.

This plant is mown both as hay, and for seed; as also, for feeding. The first growth is usually mown for hay, and fed off; the second is for seed. It is of great benefit as a summer food for hogs; and horses, cows, and sheep subsist well on it.

The difference between mowing and feeding off is considerable. If the season be dry, and hay scarce, the mown product advances in profit. Wet seasons are beneficial to most grasses: but however small this produce may be in a dry year, it is in this, nevertheless, a richer and more nourishing food for cattle.

If milch cows are confined to clover alone, and butter be made of their milk, it will taste; but if they have admission to a field of common grass with their clover, the butter will have none of the relish of it. Nor will cheese be so good, when cows have fed on clover alone, as when they have common grass with it.

The quantity of seed used on a generality of soils in common state of preparation, is twenty pounds to an acre.

Clover sown alone in autumn, is, at best, not near so profitable, and mostly attempted with loss only.

2. L U C E R N E.

LUCERNE is a nice article in its cultivation; which is administered in no less than three different forms, viz. By the drilling mode, the broad-cast, and by transplantation.

In the first, the culture is not very expensive, though the profit is not nameable till the second or third year, when the cuttings are considerable, as well as the perfection of the plant, which is continued afterwards in a state farther improveable, by proper manuring and other treatment.

The second kind of culture is easier, and with less expence; but the land is soon wearied by the necessary harrowing for extirpating the weeds, and the crop itself declines very much in the third and fourth years.

The last mode is considered as a most important one for continuance. The transplanted lucerne has such superior capability of improvement in its future growth, as, with its peculiar culture, in a series of years, to out-rival the drilled both in profit and product; but the expensiveness of it renders it an object only with the wealthy and opulent.

The several methods above mentioned will be recapitulated, with their more minute purposes and intentions, for the application of each to conveniency and particular circumstances.

The best vegetable soils in a farm are properest for lucerne; and such land as is flat and wet, may be greatly improved for it, by draining and good manuring, in the first place; 2dly, by cropping turnips, in double rows, with three-feet intervals; 3dly, by reversing these intervals, after the turnips are off, and ploughing them well

well to and fro, and arching and harrowing them fine. With this preparation, lucerne may be drilled, on flat and wet land, in three rows at one foot asunder, and yield a very good product.

The time of drilling this seed, is the end of April, with four pounds for each acre: and a clear profit of six pounds on an acre, may be obtained with diligent exertions in this husbandry.

Horse hoeing will require an interval of three feet; and the hand hoeing may be admitted in six-inch distances.

Horse hoeing (in which the earth is alternately thrown on and off the plants) is of great benefit; it keeps the tillage deep, mixes the soil well with the manure, and renders it in fine order.

Hand hoeings are applied as needful; that is, when the weeds appear among the plants, or when the land near to the rows, after horse hoeing, grows hard and clings.—But nothing is to be expected in raising lucerne, if diligence or expence be spared in cleaning it, as the weeds are sure to destroy the grass wherever they deprive it of any part of its due nourishment. The plant grows all the year, and may be cut four or five times.

This produce grows well in a dry season, being assisted with manure, or having a rich soil; and becomes very valuable, in such cases, when other foods and grasses are destroyed, or when the keeping of cattle is attended with infinite difficulty, and the disposing of them with much loss.

Cultivating lucerne for three or four years, is a method of securing a profitable return; one or two, is not sufficient to effect it, which ought only to be considered as a time of preparation. It is far from a perfection of growth in the second year.

The cleaner and more fertile the state of the ground, the more beneficial for the crop; and when the land is highly prepared and amply manured, there is good foundation to expect a quicker reimbursement of expences by enlarging the crop, and forwarding its maturity.

The

The broad-cast method brings lucerne sooner to a declension in goodness; the harrowings for destroying the weeds (which must at all events be regularly given) weakens and destroys the plant itself. But it is not thus with the drilled; the benefits of horse hoeing, and the convenience of hand hoeing the crop, encourage the growth and give duration to the perfection of the plants through many years.

The consumption of lucerne green, is to be preferred to making it into hay; as the former gives fairer opportunity for the requisite horse hoeing, which must be performed immediately after cutting; for, if the plants fill the spaces before that operation, in a small degree only, they will be damaged by it.

Lucerne, in the broad-cast method, is a crop, whose returns may be more depended on, than those of crops of corn, whose preparation is, besides, very expensive.

This culture consists of several good ploughings (if the land be out of heart), half a dozen harrowings, twenty pound of seed to an acre, sown towards the end of April, &c. then, with an annual harrowing with a heavy-loaded harrow, manuring and weeding when necessary, the plants continue flourishing three or four years, yielding three crops a year, and a clear profit on each acre to the average amount of two or three guineas a year.

But clover, which, by being sown with corn, comes immediately to perfection, is to be preferred to this crop; and so is lucerne in rows; unless on a remarkable conformity of soil and husbandry, in view of which, alone, the above account of the broad-cast culture for it is given.

But the best method of raising lucerne, is, by transplantation. For the operations of which, abide by the following, viz. Let the land be rendered fine which you intend for a growth of transplanted lucerne, and the plants for it taken from a soil that has been well prepared, of about ten inches height (their roots being four or five inches, and their age above twelve months);
clean

clean off their tap roots and herbage, and insert them in holes dug three feet four inches from each other, in three rows at one foot asunder, with a thirty-inch interval for the horse hoeing. This part of the culture is to be prosecuted in the middle of August. The plants are to be followed with horse and hand hoeing, for loosening the soil, encouraging their growth, and checking the weeds. The second, and every future year's crop will require a manuring, with horse and hand hoeings for the above purpose, though these will be fewer than for the cuttings of the first year.

This crop will continue to increase in value some years, in which it has a superiority to the drilled; and the profit, after the second year, with diligent husbandry, will shew the plant to be worth the variety of care and expence used to point out its most prosperous means of cultivation.

Horses, oxen, cows, or young cattle may be very cheaply fed with lucerne, if confined with it; and great advantage of manure derived from that application of the produce.

Lucerne is a proper food for dairy cows, and breeds more milk than clover. If they feed on lucerne before it is full grown and in blossom, no ill taste will attend either the milk, cream, or butter. There is great propriety in a farmer's sowing enough of this plant to be a principal summer food for cows, as it is cheaper than any common grass.

3. S A I N T F O I N.

THIS grass, like lucerne, does not arrive at perfection the first or second year.

Though it very well answers planting on clay soils; the light, sound, gravel loams, such as are good for turnips, are better, and it thrives with great superiority on them. Saintfoin, therefore, may be cropped with good profit on land immediately adapted for turnips,
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in cases where there happens to be more of it than the farmer would willingly apply to that root.

It yields most in the broad-cast method; and is to be sown with barley in April: The quantity, four bushels of saintfoin with three of barley to each acre.

This crop may be sown twice in a year, without endangering a decay; and five guineas, annual profit, on each acre, are a low average of the returns of its cultivation.

A cow that eats saintfoin alone, will derive no unpleasant taste to her milk or cream; nor will the cheese or butter made from them differ in goodness from the common ones.

4. BURNET.

THE most beneficial crops of this hay are obtained with planting twenty pound of seed for it, with barley, on each acre; and the peculiar appropriation of the product is to sheep feeding; but young cattle, oxen, cows, and calves, may be fed with it.

With a feed of burnet, cows yield a very good milk; and the cream and butter are preferable to any with the common way of feeding.

5. TREFOIL.

AS trefoil hay seems a grateful food for cattle, and is raised pretty much on suitable lands, its name shall be preserved among the other grasses mentioned in this book.

Twelve pounds of seed may be sown with barley, on an acre, in the manner of clover; and care is to be taken in its coming up, to clear it of the weeds, and to repress the growth of the couch grass, which is a great detriment to the hay of this produce.

Trefoil is far from being a profitable culture on wet soils, especially if they undergo preparation for it. But it lasts long on dry soils, and is frequently planted on them, in preference to common clover, on this account.

C H A P. V.

*Of the APPLICATION of common MEADOW
LANDS, &c.*

COMMON grass lands are nothing impoverished by being mown successively for a number of years; and a respectable profit is to be obtained on each acre (with the expence of such rolling as shall be necessary to level the ground for the scythe, and a little manuring) by the above disposition of the growth. It is, besides, better for the land that a crop be mown, than fed off by cattle. By the latter it is both prejudicially dunged and trodden in many places; whereas, when it is mown, and fed in the stalls, the surface of the land is suitable, and the manure for it provided, so that it may, at a proper season, be equally dispersed for the purpose of a regular crop, and the general benefit of the soil.

Pastures in large are better than when divided and broken with hedges and gates. The land may be proportioned to the stock of cattle, which will thrive better by being left to find the food peculiar to each; nor may their sagacity therein be disputed, if not limited too narrowly.

Grass lands are often under a necessity of being drained; but the choice of the most serviceable method is much restricted, by a notion of its being expensive. The *open drain*, which is usual for this branch of husbandry, is attended with a loss of land, and necessary cleansing every two years; but the *covered drain* will last a dozen or fifteen times as long, and give back the disbursement for it (by saving both land and expences) in a few years. The latter is described and recommended under the head WHEAT.

C H A P. VI.

H O P S A N D V I N E S.

I. H O P S.

IN this production, particular regard is to be had to the situation, the sort of hop, with the poling and drying them, the soil, and the keeping the alleys and hills well prepared.

Spring is the time for dressing the hills ; each of which is to have two quarts of suitable manure rendered into the earth finely and without lumps. The intire mixture of the manure with the earth keeps the roots from the injuries of a dry season, worms, &c. and gives strength and vigor to the vines, making them shoot apace and yield a large product. When they are almost ready to blow, pour two quarts of manure liquor on each hill, at a little distance from the vines ; but be careful not to touch the vines with the liquor, and to use no more than the quantity directed.

The hop of the suckers or off sets are to be planted in March, according to the commencement of fine spring weather, after the hills are raised and cleared of the weeds, &c. The hills are to be in rows at convenient distances, with alleys or spaces between the rows for horse and hand hoeing ; which operations are the chief charge in the hop husbandry, and must be given, to loosen and hollow the earth for the better nourishment of the plantation, and to remove and prevent the growth of the grass and weeds. The plants are to be eight or ten inches long, and three or four joints in each of them. These being ready, the holes for the sets are to be dug a foot deep, and the same over, to make the earth light and easy for their shooting. Two or three roots are to be deposited in the middle of each hole, and held in the hand till the earth is returned, which is to

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be pressed about the roots; the same end being placed uppermost, which grew so before, and their tops laid level with the ground. When the beds are made large, a set is sometimes put at each corner.

When the hop vines are grown two feet high, they are to be bound with rushes, or long grass, to their poles, which are to be placed strong in the ground, to guard them against over-setting by the wind, and damaging the vines and roots in their fall. The poles must lean outwards, to prevent too much shadiness, which is occasioned by the vines intermingling and growing together, and hinders their blossoming and ripening. The weeds must be diligently watched and removed from about the beds or hills; and in dry seasons the hills should be watered, their sides being placed highest, that the roots may have the greatest portion of moisture from the rain or water falling on them.

The blowing and belling season is towards the end of July, and they ripen about the end of August, or commencement of September at farthest.

*The plant, when ripe, imparts a fragrant smell;
Brown shades the seed, and dusky looks the bell.*

When they turn brownish, either in seed or bell, they begin to pluck; and as great loss is sustained by the wind's scattering them, the business must be shortened by increasing the number of hands employed in gathering. If any of the vines grow on two poles, they must be divided at two or three feet distance from the hills, that their cutting may neither draw the strength of the root too much, nor cause the vine of the hop to bleed.

A square blanket, or hair cloth, fastened at the corners upon short staves or poles, may receive the hops as they are picked; and where there is convenience, a temporary covering erected over the pickers is advisable, to defend both them and the hops from the violence of storms and the heat of the sun, with which the picking may go on more uninterruptedly. Otherwise, little is to be drawn and cleared at a time, for the in-

terposition of wind and rain may greatly decrease the crop.

Hops must not be gathered while the dew is on them; nor should they be over-ripe, as they lose their green color, and fail in strength and product by standing too long.

They are dried in malt kilns, by laying them a foot thick, for the space of twelve hours; but no smoke is to come near them.—After coming from the kiln, they must be laid in some room to toughen (otherwise they crumble); and being thus prepared, they are put up in bags, and will keep several years.

The hop malady, called the Mould, seldom attends those that have the soil in fine tilth and good order for admission of the air and rains to the roots of the plants; but is found where the surface of the land is hard set and flat, which retains the water, from whence this noxious effluvia or damp is derived and transmitted.

The poles, when dry, should be laid in a dry house, till the season returns for their being wanted.

2. V I N E S.

THE land for a vineyard may be chosen where the bramble grows; it should be light, sandy, and laying to the south or south east, if on the declivity of a hill the more preferable. If it have a chalky bottom, or be, toward the surface, a little stony, so as there are no springs in it, it will not hinder the plant from thriving; nor will the hot and dry soil be unfavorable, if it be free from the heath.

On very rich soils, unfruitful branches with insipid leaves abound, and but little fruit is discerned; but, the barren and poor land stops the roots from shooting deep into the earth, and occasions their spreading toward its surface, where they derive pregnancy from the refreshing dews and showers, the cheering sun and invigorating vapors, which have so many recipients in their delicate pores;

pores; and thus the joints are short, the leaves not so luxuriant, and the quantity of fruit greater.

To rid the vines of the morning dews soon, and to have them on late in the evening, the vineyard is to be planted east and west.

In planting, first, procure such sets as will come early and be soon ripe; then dig trenches near a foot deep, at near a yard distance for the easier giving the necessary labor and work in the different seasons of the year. These trenches are to be of an equal size and height; then set your plants, which are to be sixteen or eighteen inches in length, having three or four eyes of the young wood on them—The parsley, early black grape, and the small muscadel, are generally deemed the best kinds for producing. Place them in the bottoms of the trenches, a little sloping, and cover them three or four inches with the mould; then level the ridges so that the sets may just appear above the surface. You may, after this, plant the sets rather more than two feet from each other; and then strew some manure along the ridges (but not too thick) which will preserve them. In the winter season, use weeding and hoeing; and when they begin to shoot, put props either of hazel, or other kind of wood, about four feet in length and about three inches round, on the north side of the plant. If any suckers rise from the roots, cut them off; but leave those on which grow from the stem: This is to be done in May and June, when you will discover what branches are to be left for the next year. Then tie them to the prop; and at the same time, in the heat of the day, prune, break, or crop the branches, but do not cut them, because the wounds with a knife, &c. are injurious. Thus treat them till their fourth year; for before that time comes about with them, you will have but little fruit. When the plants bear well, three or four shoots may be left to each, with about four eyes; but as they advance in age, six or more may be left.

Pruning is to be given the latter end of December or early in January, and the vines not suffered to be higher than
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the props. All the small shoots that are not likely to bear good fruit, are to be pruned; then tie the master branch with a tender ozier, about a foot from the earth, and bend the top of the vine from the next prop, about two feet from the ground, that the ranks may appear in neat form, or like an arch. The shoots are particularly to be tied from the eyes left the preceding year, as the new shoots will not bend, and a little matter breaks them, by which all the fruit they might produce will be lost. When the fruit is set, and appears as large as shot, crop off the top of the shoots, and leave only two joints above the bunch; but take care always to preserve the strongest shoots for the next year: This should be performed in June, or the latter end of May, if the season prove kind, at which time prune off the water shoots. Then, in August, when the fruit begins to ripen, break off such shoots as are grown too thick since your last pruning. The fruit must be a little shaded from the sun's heat in the day, as well as from nightly dews, which fall much at this season of the year. In January, when you prune, cut off the old wood close to the ground, and supply the place with the best of the young wood, which was left four feet high, and order it as before.

When the vineyards want fertilizing, strew some manure on the ridges and about the ground between the rows of the props, in the month of November, wherewith the earth will be meliorated through the whole winter, the roots of the vine be greatly strengthened, and the frost prevented from piercing them. Sixteen bushels of manure is to be used on an acre of the vineyard.

Vines that are planted against a wall, pale, or house, may be kept to any height the owner pleases, or the place will permit. The pruning is to be performed in the manner above mentioned; but these are to be cut in the middle of the joint, when pruned, which is done best in January, June and August.

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When these want refreshment, they are usually watered with two quarts of manure liquor to each root; which being carefully kept off the stocks and dispersed only near the roots, makes the vine vigorous in putting forth, and the shoots strong. The same application is to be made at Midsummer, when the grapes are small, which nourishes the roots, and conduces to a greater plenty of fruit.

If the season be wet when you gather, and the grapes not perfectly ripe, press the green juice into hogsheds, and place it in a warm vault, and it will become mellow; or if it do not, a stove or other machine must be provided in the vault or cellar, the heat of which will cause a fermentation, and ripen the wine to a fit state for drinking.

All green wines should receive this mellowing qualification before they are drank, as very ill effects have been experienced on their use without it.

C H A P. VII.

F O R E S T T R E E S.

I. C H E S N U T.

THE wood of this tree is durable, and constructed into divers parts of houses, as well as wrought into several necessary implements and utensils for their internal furniture.

Nuts for seed are prepared, 1st, by spreading them to sweat, in September, between layers of dry sand; 2dly, having provided a lye from manure, and put these into it, choice is to be made of those only which sink to the bottom; 3dly, by drying the chosen ones for a month; then sanding them; after which they are to be laid to dry again, till the beginning of the spring. They are

are then to be set in rows as you would beans, putting them into the holes with their points upwards, where they are to be left two years; and when they are moved, it must be about November. But they may be planted at first, where you design they should stand, having ordered them in the manner above directed.

A light ground, or moist gravel, favors the growth in most eligible degree; though they thrive in clays, and almost any kind of soil. Hills, or their declivities, even to a north exposure, will bring a good tree and fruit, if care be taken to keep the weeds off at their first planting.

The chesnut tree ought to obtain more frequent standing in parks; as resembling the tallness of the oak, and bearing a fruit that serves extremely well for fattening deer, which eat them with avidity, and acquire good flesh thereby.

The horse-chesnut tree may be planted as affording a most delightful shelter, in summer, to workmen in businesses usually performed in the open air. They may also become the support of paling, and will answer as so many oak posts, where much paling is required, having mortices cut in them to receive the ends of the rails, at the same time that the tree lives and produces a fruit, though somewhat bitter, yet larger than the sweet chesnut, and equally fit for both deer and hogs, which take to it as a food with good appetite, and, the latter especially, fatten fast thereon.

The nuts for this growth must be planted and transplanted in a nursery, till the young trees are eight or ten feet high; when, having their leading or master shoot on, they may be replanted in the place intended for their future standing.

2. W A L N U T.

TO obtain thriving trees of this name, gather some nuts from one that is prosperous, and in its prime state of bearing, which lay in a room to dry, and
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turn them sometimes with a broom. Early in October, put them into sand that has been a little moistened with manure liquor or lye, and let them remain in it till Christmas, which is the time they begin to spear. Do not steep them; but having stripped off the husks at the end of January or beginning of February, set or sow them, and strew above some furzes that have been broken or chopped small, as a preservation from rats and mice, which otherwise prejudice the shell while tender.

It is most suitable to this tree, to be planted at first in the place designed for it, as it very ill endures shifting or moving.

The walnut delights in a rich, sandy ground, inclining to a chalky marle; and will thrive better if protected from north winds, though it is favored more by cold, than by excessive heat.

If the under boughs of this tree are lopped off, it will run up to a great height, though it is long in arriving at a completion of its growth. There is an oil in use with painters and others, made from it; besides which, the timber is good and in request for many well-known, serviceable purposes, and, at its due age, becomes very bulky and valuable. These, with the annual product of its admired fruit, are considerations which should excite a more frequent culture of it.

To forward this vegetable, the ground in which the shoots run is to be kept continually well pulverized, and a fertile manure laid on it once in two or three years, particularly against the fall of the first winter rains, which wash it into the soil with advantage. Hoeing and pruning must constantly be given, till the tree comes to six feet high; and with budding, it bears the sooner,

3. H A Z E L.

UNDER the term hazel several sorts of nuts are comprehended, viz. the white and red filberts, the Spanish, and the large cob nut.

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Filberts

Filberts would answer well, planted near London (or so that the carriage thither comes but to small amount), because there is always a market for them. The trees grow on almost any soil, if well tilled and manured; the sets are transplanted at an easy expence; and, if the suckers are pulled from the roots in proper time, the fruit will be considerable in quantity and quality.

You may sow the hazel seed in a furrow, about the end of February. The furrow is to be dug six inches deep, and when covered, some good manure is to be scattered on it, which will make the roots strike out with vigor, and increase very much.

Mice, if they get at them, will devour the kernels of this seed, and frosts prove unfriendly to it; wherefore, to avoid complaint by the latter, defer sowing till after the frosts are gone; and use a similar security to that recommended for the walnut against the depredations of the former.

This tree is sometimes cut into hedges, at other times arched into a shade for walks. The wood is employed in a variety of works by country people.

4. M U L B E R R Y.

THE mulberry grows on a very hardy tree, in clay and gravel soils. It is of two sorts or colors, viz. white and red, which are large and full upon the branches of the tree, and pleasant to the taste when ripe. A cooling, delicate wine is sometimes made of them; they are also of use in medicine, and their leaves are a necessary food for silk worms. The wood is of a close grain, and will endure and resist wet as ably as oak.

This tree may be raised of layers from the suckers in spring; and also grafted in the spring; or from the seed, which is obtained in a better state for vegetation in the dung of hogs or fowls, that have eaten the fruit; just as holly, &c. are found capable of a quicker change to vegetation, by fowls eating their seeds, than by their
simply

simply lying in the ground, unless the ground is rendered rich and warm by manure and tilth for them.

When the young trees appear above ground, moisten them a little, lest the sun's heat prove too dry for them. Keep them clear of weeds till they are strong enough to preserve themselves; and prune them of the side boughs during the first five years, at the end of which they are to be transplanted into the places designed for them.

At their first sowing, strew some manure thinly over them, which will hasten their growth and enrich the fruit.

5. E L D E R.

THE elder tree is very easily raised. Cuttings from it, eight inches long and an inch and a half round, are stuck in the ground in February, which take root, and shoot successfully, if it be not of too dry a nature. The earth is to be lightened about the young tree, and manure laid on it above the roots; with a watering now and then, in very dry seasons. It grows in small space, and will bear berries in the first year sometimes; or, when transplanted, in the second, at farthest.

The fruit is of two colors, viz. white and red; and the wine made of them is much known, and in good esteem. If made of the latter, it serves as a cordial in winter, when mulled as port or claret; and when produced with use of the former, it resembles the white French Frontinac in color and quality.

The red berries are also boiled in a high-colored, and the white in a pale wort; when, with the assistance of other proper ingredients, they compose a pleasant, wholesome liquor.

C H A P. VIII.

The general MANAGEMENT of FRUIT TREES.

THOUGH the manner in which fruit trees are raised is generally from seed, they are frequently propagated by grafting scions or branches of one fruit on the body of a plant of different production.

When trees have been raised from seed in a nursery, and transplanted to some place where they grow well and produce good fruit, some of their branches may be cut, at the proper season, and inserted with success, even in trees which flourish in a ground otherwise unfavorable to such inserted or inoculated fruit.

In time of transplanting, take care neither to break the roots, nor to suffer the young thread-like fibres to dry too much, lest you hurt the life of the tree, these being the grand vehicles or conveyancers of its nourishment and support. If they are set too deep in wet and moist lands, they are chilled, and perish by them; and if planted too high in a dry ground, the sun, wind and dry weather have too great power on the root, and stop it in its progress of shooting into the earth. Room is to be given them for convenient spreading of their heads, and receiving the genial influences of the sun and air for their improvement; and they are to be supported with stakes, &c. till they have struck roots sufficient in depth and number to bear them up against hindrance of growth by winds or cattle.

All broken roots are to be cut off before they are planted; and likewise a small part of the present year's shoots or fibres: This is to be done between September and March; but when performed late in March, and followed by drought, watering will be necessary, otherwise, the plants will languish and die; as also, some
fern,

fern, weeds, or wet straw, laid about the tree, will be salutary, and shield it from prejudice by too dry a soil.

If the tree be bark-bound, or thrive not, draw the point of a knife from the fork to the budding or grafting part, slitting the bark in three or four places on the body of the tree.

Great care and attention is to be given after the tree is set and in a growing state, to direct and form the branches into a neat and proper course, which they will then retain. A wall or pale tree is to be managed so as to have branches spreading against either, in an upward sloping direction from the roots to the top of the tree.

The water shoots deprive the bearing branches of proper sap, and must, therefore, on discovery, be cut off; unless when a part against a wall is naked, then leave one or more of these branches to fill up the void place, so as to make the tree uniform the ensuing year.

Standard trees are, likewise, to be pruned of the many useless shoots which only fill the head of the tree, and deprive the fruit of part of its nourishment: As they return every year, so soon as the tree has got a sufficient head, they must be pruned off; in order to expose the fruit to the sun, which ripens and hastens its maturity.

Want of diligence, is sometimes the occasion of the trees being covered over with moss, and when they are neglected in this case they become unsightly, and are often cut down. To remedy this evil, scrape off the moss from the body and branches, with a horn or wooden knife, to prevent wounding, and after the next shower of rain has fallen, rub them with a hair or woollen cloth, to clear them intirely from the moss: This gives the tree liberty for exudation of the sap, and causes it to recover, and bear fruit. Thus, in orchards, a fruit tree, seemingly barren, by having its branches pruned near the fork, and one branch only left on to draw the sap, will, in two or three years, if the interference of bad seasons prevent not, have a fine head, and yield abundance of fruit.

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To prevent wet from rotting the bodies of trees after pruning, the upper part of the branch is to cover the under with a sloping projection.

In manuring for fruit trees of large growths, two quarts for each must be very well mixed with earth dug from the hole for the tree; or one quart for smaller ones; which must be fine, and not suffered to lie in the earth in lumps. A little plain mould may be laid about the root, that the manure may not penetrate to it immediately, because it then is prejudicial; but when it lies a while in the earth, and soaks gradually towards the roots, with watering, rain, &c. it becomes a proper, healthful nourisher.

If trees that have been planted some time, stand in need of refreshing at their roots, dig the surface of the earth to make it loose, then put two quarts of manure round the roots, at a small distance from the body, which will find a quick passage into the earth, and be greatly assistant, with dews and rain, to vegetation. This may be done twice a year, viz. in spring, when the trees blossom; and at midsummer, when the fruit begins to be large: the former application is beneficial in respect of the sap for the blossom, and the latter invigorates it for the perfection of the fruit. Manure liquor may serve with equal success; but no more is to be used at a time, nor may the plants receive it oftener than twice a year, lest a hurt, instead of a benefit, be derived from it.

C H A P. IX.

Kitchen Garden Productions.

I. A S P A R A G U S.

ASPARAGUS is to be raised in beds about four feet wide, and of any convenient or suitable length. A trench is to be dug three feet deep; this is to be filled with rotten dung that is almost become a mould, or with
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horse dung not rotted, which must be trodden down as hard at the bottom as possible; then, within a foot from the top, put some mould finely sifted, till the bed is high enough to receive the plants, which must, at least, be six inches above the surface of the ground, the plants being a year's growth; then put four rows of the plant in each bed, about eight inches asunder, till the length of your rows is completed. Let them remain thus two years ere you cut them, and they will be the stronger and better; some do not cut them till the third year is expired. When the roots are planted, as above directed, lay manure thinly over the beds, which will soak into the earth with the rains and dews; this is to be performed, twice a year only, as well on the old as new beds, which strengthens their growth, and occasions an increase of their heads.

Another method, is, to make a bed of fine and well-sifted mould, with holes about two inches deep and eight inches asunder; three or four of the seed are to be put into each of these holes, and to be left to grow without transplanting; but manure the ground twice a year, as in the former direction: with this conduct you not only prevent the check and hindrance of the growth of the young plants, which happens on their being removed, but are a year forwarder in their production.

2. S A L A D S.

WHEN the beds for falads are marked out and prepared, sift some manure finely over them, or rake it into the earth, so as they may be intirely pulverized together; then sow the seed, and afterward give another raking; then strew or sift some more manure very thinly on the land, to preserve the seed from slugs, &c. which attack the plants as soon as they appear above the ground, and, where not prevented by this mean, frequently destroy whole beds.

In transplanting falads, for improvement of their growth, the intended beds are to receive good preparation,

72 ONIONS, LEEKS, CUCUMBER, &c.

tion, that is, the earth and manure must be rendered very fine together, through a sieve if possible; and thus the plants will be larger and more delicious for eating, and their growths escape uninjured by reptiles, &c. both in and on the earth.

3. ONIONS, LEEKS, &c.

THESE are to be sown in beds in February or March, on a warm ground where it may be had for them. After the seed is sown, some manure must be thinly strewed over the beds; but sow not too early, as the frost sometimes takes them, and then the whole must be sown for again.

After the onions, leeks, &c. are come up, if they appear too thick, they are to be thinned, by pulling them for eating, or transplanting: but the leeks, especially, when drawn for transplanting, are to have holes of a good depth, and a little manure well mixed with the earth of them.

August is the sowing time for winter onions, which gives them time to come up before the cold weather is set; and of these, when thinned, the remainder will be good the summer following. If they seem to grow too strong in the blade, tread them down with your foot, which proves a check to the sap, at the same time that it increases and enlarges the root.

Garlic, shalots, &c. are sown in the above manner.

4. CUCUMBER, &c.

THERE are three species of this plant cultivated in gardens, viz. the common kind, the white one, and the long green one. The first is what is brought to market in England; the second is the common Dutch kind, and is greatly preferable to ours, as being much firmer, and having fewer seeds; and the third is better even than that, but it is raised with difficulty.

The common one is raised at three different seasons of the year; the first is on hot beds, under garden frames,

frames, for early fruit; the second is under bell or hand glasses, which is for the middle crop; and the third is on the common ground, which is for a late crop, or to pickle.

The cucumbers which are ripe before April are unwholesome, being raised wholly from the fermentation of dung, not by the sun's heat. Those ripe in April are good fruit, and are raised in the following manner: toward Christmas, or the beginning of January, a quantity of fresh horse dung must be procured, with the litter among it, and a small proportion of sea-coal ashes should be added to it. In four or five days the dung will begin to heat, at which time a little of it may be drawn flat on the outside and covered with two inches thickness of good earth: this must be covered with a bell glass, and after two days, when the earth is warm, the seeds must be sown on it, covered with a quarter of an inch of fresh earth, and the glass then set on again. The glass must be covered with a mat at nights, and in four days, the young plants will appear; when these are seen, the rest of the dung must be made up into a bed for one or more lights. This must be three feet thick, and beat close together, and covered three inches deep with fine fresh earth; the frame must then be put on, and covered at night, or in bad weather with mats.

When the earth is hot enough, the plants from under the bell must be transplanted into it, and set at two inches distance. The glasses must be now and then a little raised to give air to the plants, and turned often, to prevent the wet from the steam of the dung from dropping down upon them. The plants must be watered at times, with water set on dung till as warm as the air in the frame: and as the young plants grow up, the stalks of them should be earthed up, which will give them great additional strength. If the bed be not hot enough, some fresh litter should be laid round its sides; and if too hot, some holes should be bored into several parts of it with a stake, which will let out the heat; and when the bed is thus brought to a proper

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coolness,

coolness, the holes are to be stopped up again with fresh dung. When these plants begin to shoot their third, or rough leaf, another bed must be prepared for them like the first, and when it is properly warm through the earth, the plants of the other bed must be taken up, and planted in this, in which there must be a hole in the middle of each light, of about a foot deep, and nine inches over, filled with light and fine fresh earth, laid hollow and in form of a basin: in each of these holes there must be set four plants; these must be, for two or three days, shaded from the sun, that they may take firm root; after which they must have all the sun they can, and now and then a little fresh air as the weather will permit. When the plants are four or five inches high, their stalks should be gently pegged down toward the earth, in as different directions as may be from one another, and the branches afterward produced, should be treated in the same manner. In a month after this, the flowers will appear, and, soon after, the rudiments of the fruit. The glasses must now be carefully covered at nights, and in the day time they should have gentle waterings, sprinkling over the whole plants. These will produce fruit till about midsummer, at which time those of the second crop will come in to supply their place: these are to be raised in the same manner as the early crop, only they do not require so much care and trouble. This second crop should be sowed in the middle, or towards the end of March.

The season for sowing cucumbers for the last crop, and for pickling, is toward the latter end of May, when the weather is settled: these are sown in holes dug to a little depth, and filled up with fine earth in form of a basin, eight or nine seeds in each hole. These will come up in five or six days, and till they are about a week old, are in great danger from sparrows; after this they require only watering now and then, and keeping clear from weeds. There should be only five plants left at first in each hole, and when they are grown a little farther up, the worst of these is to be pulled up;
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that there may finally remain only four. The plants of this crop will begin to produce fruit in July.

Melons are sometimes raised with the mowing of grass walks, or weeds cut green, and put in a hole that will contain a bushel or more; the grass is to be trod in close, and covered with good mould, well sifted, six inches deep; and a bell glass set at the top: when the fermentation begins, put in the seed for melons; and in this way they will be very good. To prevent slugs, &c. from coming near the plants, after the beds have been prepared as above, strew a little manure lightly over them.

The seed for the Pumpkin is put into the ground about the end of April, at about a finger's breadth; and if it be sown on an old dunghill, it will spread and grow,

5. H E R B S.

KITCHEN and medicinal herbs are sown in the spring. Prepare the beds for them, as before directed; and after the seed for each sort is sown, sift some manure over the beds, which will defend the seed from slugs, &c. give vigour to the plants in striking their roots, and add to the several species in their seeds; for, with the showers and dews that fall on the beds thus manured, a nitrous quality is derived to the vegetable life, which advances and improves it. Also, the fine pulverization of the ground with digging, sifting, &c. permits the plants to shoot with greater ease, and receive the dews and rain in a more beneficial degree. But all stones, &c. are to be removed from the ground before these seeds are sown, as they obstruct the plants in spreading and receiving their nourishment.

Flower Garden Productions.

I. TULIP, *and other* BULBOUS ROOTS.

THE ground for the tulip is to be a light or sandy earth, which is also to be sifted very fine; for, the fibres of the plant are so small and tender that they cannot shoot forth where there is the least obstruction, and in this case the bulb will not thrive. When the ground is prepared, which should be done about the end of August or beginning of September, set the roots four inches deep, and at four inches distance from each other, to allow them liberty and room for putting forth their shoots or fibres, which will increase and strengthen the root, and give the blossom a better appearance. In planting, keep the bulb carefully from the least touch of the dung; but afterward, scatter some manure very thin upon the beds, to keep the worms from annoying the roots, as well as the slugs from touching the leaves, &c. In March, &c. when they come up, scatter manure thinly again upon the bed; but take care to keep it off from every part of the leaf.

The tulip, like most of the bulbous kind, whose stalk and flowers grow from the middle of the bulb, produces its blossoms or flowers from the old root, which it changes every year, and renews for its future production. Its increase is from the bottom of the roots, and the stalk that shoots from the semen in the middle of the roots produces a stalk, flower, and seed, and then falls off, as has been just observed; the new root is generated from the bottom of the old root, during the vegetation to its productive part, that is, the stalk, flower, &c. which feeds it, till it has quite lost its force, when the stalk withers; this is generally in June, or fine summer weather; and then, the withered stalk remains fixed to the new root or bulb.

All

All spring flowers must be planted in autumn or at Michaelmas; and those that blow in autumn, &c. in February or March. And a little manure should be sifted or strewed about the plants of all the bulbous kind just before they come up, to prevent insects from harboring in the roots, &c.

For different sorts of these bulbous roots, or any of a similar nature, their seeds proceed from each particular flower; and though the tulip seed may be waited for six or seven years, if saved from good flowers, it will answer.

It has been giving as the opinion of some, that the farina or dust in the bottom of one flower, is disseminated by the wind, and received by transmutation into the seed vessels of another on a different bed; and that, by this means a variegation is formed. Others have supposed, that the bee, hurrying from flower to flower, carries this dust on its hairy legs, and as it enters and departs so many, may probably catch up and deposit the said farina or dust, which incorporating with the farina or dust connatural to every particular flower, is received into the seed vessels therewith, and occasions the above agreeable effect. These are conjectured to be the natural causes of the great variety of colors in flowers not very distant from each other.

But for an artificial method of obtaining a variety of colors in seedling plants, such as those of auriculas, &c. that blow at the same time, take the following, viz. Mix divers sorts of flowers, which are of the same season of blowing, of the colors preferred, on a bed together; and the vegetating leaves and flowers will have the desired tints and hues. Thus, a gilded philirea gives the same varied coloring to a jessamin in its leaves; and the gilded, or orange mint, growing under an apricot tree, shaded the leaves of it with great diversity.

2. C R O C U S.

THERE is a great variety of this flower produced from its seeds, which are all very hardy, and increase exceedingly

ceedingly by the roots, if suffered to remain some years in the ground. They grow in all soils and situations, and are great ornaments to a garden, as they flower when scarce any thing else is up. The fibres of these roots perish when their leaves do, and they may, therefore, like all other roots of this kind, be taken up as soon as the leaves appear dead, and laid by in a dry place, till September, at which time they must be planted again for the spring flowering. They should be planted in holes made with a dibble, about two inches deep, and at two inches distance from one another; then the earth, being raked over them, should remain one inch deep. If the weather be mild; they will come up in January, and in February be in full flower. The leaves are so short when the flower appears, that it seems produced on a naked stalk, but as that decays, they grow to a considerable length; these look unsightly after the flower is gone, but are not to be cut, as that greatly weakens the root for the next year's flowering.

3. IMPERIAL CROWN.

THERE are several distinct species of this flower preserved in the gardens of the curious, all which make a very elegant appearance. There are also a great number of varieties which are propagated from the seeds of the several species, in the same manner with those of the tulip.

When they are thus raised, the best time for transplanting their roots is in July or August, before they push forth new fibres; or they may be taken up out of the ground in June, after their green leaves are decayed, and kept till August, and then planted in beds of rich earth, with some rotten dung buried deep in them. The most pleasing method of planting them is at eight or ten feet distance, in the middle of long flower beds: a hole of six inches deep should be opened with a spade, and the root put into it; then the earth is to be put in upon it with the hand, the lumps of which must be broken,

broken, and all the stones of it picked out. They will appear above ground in February, after the above management, without further care; and, if the weather be mild, grow so quick when up, as to flower in March. As this is usually a windy season, it is proper to plant stakes in the earth to tie these plants to, to prevent their being blown down; and it is a good caution never to gather the flowers, which much weakens the roots; they should therefore always be suffered to die on the stalks. The roots should be removed once in three years, and their off sets separated, and planted in beds.

4. A U R I C U L A S.

THESE beautiful spring plants flourish in April; and are usually set in the garden in small pots, on stands, where the rain cannot come, as it washes off their mealy and pleasant appearance. Great care and pains are commonly exerted in this production; and there is no way of getting a new face or flower, of any species of the auriculas, but by seed; because, the increase of old plants by their off sets, of every species, are generally the same as the mother plant, and therefore their seeds ought to be carefully saved, as only capable of procuring a variety. New faces are generally called by the names of persons producing or fancying them, the latter being mostly nobility.

If the seeds are sown when ripe and a little hardened, they may appear above ground the same season, before the frost comes and checks them. They are to be sheltered under a shed during the frost, and after it is gone returned into the open air. After sowing, the seed is to be watered; for if it be suffered to stand dry, it will not come up till the spring; and when it is sown in the spring, it must likewise be kept moist; also, when the young seedlings are up in April or May, being then tender, they must be set in the shade, lest the sun over-power and scorch them.

First,

First, in sowing this plant, the earth is to be sifted very fine, and a covering of willow mould also sifted fine above it; then the seed is to be thinly scattered over the mould, which will sink deep enough if you pat it with the palm of your hand; for if it be otherwise put too deep in the earth, it will be the longer before it comes up, and perhaps may never make its appearance above the ground, which is the case with many small seeds set too low in the earth. As they increase in growth, transplant them into other pots or cases, till they are able to bear being put in a bed in the garden, or into pots to blow.

This plant thrives well in the following prepared earth or composition, viz. Six barrowfuls of rotten horse or cow dung that is become mould, sifted through a wire sieve; one barrowful of sand, and one barrowful of manure; mix these together, and sift them again, which will prevent insects from harboring in the mould, and give the plant a more florid appearance at the time of blowing. The parts of the above composition may be lessened or increased in proportion to the quantity wanted.

When you design to preserve the seed, the pots that contain the best flowers (from which the seeds are to be taken), must not be suffered to remain long under the shed, as it draws the flowers and weakens the stalks; and thus the latter wither when they come to be exposed to the sun and air, and the seed for the best flowers will be lost for that season.

5. N A R C I S S U S.

THE narciss is also a spring flower, that blows early. It is better bought, than raised from seed, this being too tedious a mean of obtaining it, considering its value or continuance. They require a well sifted earth, with which they grow tall, and bear blossoms on their heads; they afterwards yield seed, and of these many new kinds are produced. There is no need to remove this (as is necessary every year with some other bulbous roots),

LILY. MARTAGON. RANUNCULAS. 81

roots), when raised from seed; but as the roots increase in strength and off sets, these must be taken away for the sake of room. These roots, having a thick coat, will defend themselves and endure lying out of the ground as long as any.

After the leaves are cut off from the ground, where they grow to flower, &c. it will be proper to strew or sift some manure, as this not only increases them, but causes the roots to shoot a strong stalk the next spring, and the stalks to have more blossoms on them.

6. LILY *and* MARTAGON.

THESE flowers greatly increase in a light sort of ground, which may be manured at such time as the leaves of the flowers are off, that is, in July and August. The Dutch *Lilium album maculatum*, or purple-stripe lily, has a fine purple-stripe appearance both in the root and flower; but the yellow-stripe lily is in great esteem, because of its continuance in the leaf all the winter.

The Martagon, being likewise a lily, has the same culture in every respect as other lilies; but its blossom is different from the other species, the leaves returning outward, whence it has the name of the Turk's turbant, or curled lily. Some of these flowers are yellow, others scarlet, with various spots; there is, besides, a beautiful sort from Virginia: all which increase much from their roots, and may be raised from their seeds in the same manner as the flowers already mentioned.

7. RANUNCULAS.

THIS flower, which is extremely agreeable in its variety of appearances, requires a fine-sifted mould, mixed with a little rotten dung, or mould prepared as for the auriculas; which, with a proportion of manure, will increase it, and prevent the millipedes, and other insects, from infesting its root.

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The seed, when a little dry, may be sown in cases or borders, and will endure the winter here, if it be not extremely hard; and of these, some will appear at the latter end of the next year, others not till the spring following.

The sorts of ranunculas now raised, are generally French, and may be increased to any variety with the seed, which is saved after blowing is over.

8. HYACINTH.

THERE are many sorts of this flower, as the white hyacinth, the blue, and the flesh-color; some of which are single, others double. The single sort abounds more in seed, than the double, whereof a new variety and a beautiful blowing are easily produced; the double yields a seed vessel seldom, but then it is very valuable, and the offspring, with care, is an exceeding fine flower.

The hyacinth is a spring flower, of the bulbous kind, with many fibres. The seed for it must be sown in cases or boxes, and stand two years before they are removed; they are then to be transplanted into beds of loamy mould, that have been finely sifted and well prepared; not too damp, because the roots are naturally moist; and with little dung, as too much may rot the roots. When the seeds are sown in beds, being small upon their first growth, they are liable to be lost, if the ground be not sifted through a very fine sieve on their removal.

Such of them as blow early in the spring must be put into the ground in September, in beds or otherwise, three inches deep, and four inches asunder, with a strewing of manure over them, to keep the insects at a distance from the roots; but they must never be left above the ground, for their roots perish in this case. When they appear, give a second strewing of manure, so as not to touch the leaves with it; and thus the roots will get strength and increase, the blossoms will be more in number, and the flowers larger.

9. ANEMONE.

9. ANEMONE.

THE mould for the anemone, or wind flower, must be loamy; this being dug fresh out of common, or other ground that is not stiff, and mixed with some that is good of a different sort, is further to be mixed with manure, in the proportion of one barrowful to six of earth; all these are to be sifted, or otherwise well run together, for preventing little insects from hiding under the roots.

The seed for sowing is required to be dry, and it must be gathered before it is quite ripe, or else the wind will scatter it.—If anemonies are planted in boxes or pots, with fine mould, their colors appear with many new shades.

There are divers sorts of this flower, both English and Dutch; though there is the greatest variety of the latter.

The anemone is a spring flower; but there are some of the English sorts that may be set to come up several months, one after another, by beginning to plant them from September and proceeding till March; and others that will blow from December till May.

10. FRITTLARIA.

THE frittilaria blows in April and May, or earlier, if the bed they are planted in has a favorable aspect. There are many sorts of them, seeds from the best of which may be sown as tulips, and many valuable ones will likely be produced thereby. The manuring is to be the same as before directed.

11. IRIS.

THERE are many sorts of this flower, which usually blows in May or June. The seed is to be sown in boxes or cases, for two or three years; when they will be large enough to transplant into beds. They take a fresh

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loamy

loamy soil best, which, when sifted fine, enlarges the growth of the root, and strengthens both the stalk and blossom; and particularly, if manure be sifted over the bed before they make their appearance in sight. However, a little manure must be given after-sowing, which forwards, as well as strengthens the vegetation.

The toad-flag, or what is called the *Iris Calcedonica*, is admired as a beautiful flower of this class.

12. CYCLAMEN, or SOWBREAD.

THERE are both vernal and autumnal flowers of this name; with several other distinctions of them. This flower scatters its seeds as soon as it is ripe; whence many new roots are produced. Its growth is like that of a turnip, round and flat, and may be divided into parts, by cutting, for so many distinct roots; but if rain come, or if dry dust be not sprinkled on the parts of the division, to dry up the moisture that would issue, they may be lost. The leaves of this plant appear after the flower is come up. To make the flowers blow stronger, and increase their roots, strew some manure thin beneath the leaves, or otherwise over the bed in the spring before they blow or appear above ground.

13. CARNATION, or JULYFLOWER.

INCESSANT pains are used to add to the beauty of this flower. There is a numerous diversity of them, which continue slightly after blowing as long as most flowers, yielding a fine scent and gay color.

The following earth is in great repute among the curious (who plant their carnations in pots, with which conduct they have them very large), viz. Take fine sifted mould, with a small mixture of fresh earth, and add drift sand and manure, in the proportion of one barrowful of each of the last, to six of the mould; mix them well together, then pass the whole through a wire sieve, in order to mix it still better; it is to be kept dry till wanted, for pots or beds.

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The long-podded sort are remarked and admired for blowing without trouble or bursting; while the round-podded require attendance, the pods of which must be opened to shew their blossoms to advantage. But many new faces are raised every year from the seeds of this flower, so that it increases almost infinitely in different kinds.

14. S H R U B S.

In preparing the earth for shrubs, the manure must be mixed with it so as not to be left in lumps; and the quantity of a pint of manure is to be used for each plant. The shrubs are then to be planted, but not very deep. After they have taken root, water them with manure liquor, twice a year, as other plants, viz. in spring and autumn, which will make them thrive and increase both in body and flower; but if you have no manure liquor, a thin sprinkling or sifting of manure, at the above times, will answer. The large plants may have a quart of the manure liquor, &c. dispersed about each of them; not too near their stocks, nor on their leaves, but so only as the roots may be benefitted with it; which will not only invigorate these trees, but all in the quarter or bed, whether bulbous or of another species.

C H A P. XI.

C A T T L E.

1. H O R S E S.

On the Choice of Horses.

WHEN you bargain for a horse (which you should not before you ride him, because he may start and stumble, though he be handsome to look on), examine strictly, his teeth, eyes, legs, and wind. And in order to know his age, raise his upper lip with your finger and thumb: if his teeth shut close, he is young; but if

if they point forward, and their upper and under edges do not meet even, he is old; and the longer his teeth are (the gums being dry and shrunk from them, looking yellow and rusty), the older he is.

If his eyes are lively and clear, and you can see to their bottom, and the image of your face be reflected from thence, and not from the surface of the eye, they are good; but when muddy, cloudy, or coal black, they are bad.

If his knees are not broke, nor stand bending and trembling forward (which is called knuckling), his legs may be good; but if he step short, and dig his toes into the ground, beware of a founder, or at least a contracted back sinew.

If his flanks beat even and slow, his wind may be good; but if they heave double and irregular, or if (while he stands in the stable) he blow at the nostrils as if he had just been galloping, these are signs of a broken wind.

Next inquire whether he bite, kick, stop, or start. A horse may be found, though guilty of all four; and as they are not to be discovered by barely looking on the horse, I refer you to his keeper concerning them.

A horse with thick shoulders, and a broad chest laden with flesh hanging too forward, and heavily projecting over his knees and feet, is fitter for a collar than a saddle.

A horse with thin shoulders and flat chest, whose feet stand boldly forward and even, his neck rising semi-circular from the points of those thin shoulders to his head, may justly be said to have a light forehand, and is fitter for a saddle than a collar.

Be careful not to buy a horse that is light-bodied and firey, because such soon destroy themselves. A horse is said to have a light body, when he is thin or slender in the flank; a good body, when he is full in the flank. If the last of the short ribs be at a considerable distance from the haunch bone, though such a horse may have a tolerable body for a time, if he be much labored, he will lose it.

When you are buying, it is common for the owner to say in praise of his horse, that he hath neither splint, spavin,

spavin, nor windgall. To guard you against imposition, those three are thus described.

The splint is a fixed, callous excrescence or hard knob, growing upon the flat of the inside or outside (and sometimes both) of the shank bone, a little under, and not far from the knee, and may be seen or felt.

The spavin is of the same nature, and appears in like manner on the shank bone behind, just below the hock.

The windgalls are several small swellings, appearing a little above the fetlock joints of all the four legs. They seem (in feeling) to be full of wind or jelly; but these never lame a horse, whereas the splint and spavin always do.

To discover if a horse stumble or start—In mounting him, keep yourself in a profound calm, and let him neither feel your spurs, nor see your whip; when you are seated, go gently off with a loose rein, which will make him careless; and if he be a stumbler, he will shew it in a short time.

The best horse may stumble; but if a horse spring out when he stumbles, as if he feared your whip and spur, you may justly suspect him to be an old offender. A man should never strike a horse for stumbling or starting; for, though the provocation be great, the fright of correction makes him worse.

The foregoing remarks are applied to the general appearances on which horses are chosen or rejected, at time of purchasing. *For a more particular account of their other natural or acquired infirmities, as well as every distemper the HORSE is incident to, with the methods of treating them, the reader is referred to the CATTLE KEEPER'S ASSISTANT*.*

Of

* The CATTLE KEEPER'S ASSISTANT, which comprehends the treatment and cure of every disorder incident to HORSES, OXEN, COWS, CALVES, SHEEP, LAMBS, HOGS, and DOGS; together with observations for the choice of them, and rules for their management; by J. RINGSTED, Esq; may be had of J. DIXWELL, No. 148, St. Martin's Lane, near Charing Cross. Price 1s. 6d.

Of their Breeding, Rearing, &c.

IF you have a particular opportunity of a fine stallion when your mare is not naturally disposed to receive him, or will not stand to be covered, give her drink of clarified honey and new milk mixed together; then with a brush of nettles pat her hinder parts, and immediately after offer her the horse, and she will receive him.

When a mare has foaled, you should remove her into the best grass you have that is fresh and unsoiled, to make her milk spring; and if it be early in the year, take care that there be good shelter for her, and let her colt run with her for the most part of the summer following.

If your mare have been difficult in foaling, or cannot cleanse after she has foaled, take a quart of old strong beer, and boil in it a handful of fennel, with a fourth part of the best olive oil, and mix them well together. Give this to the mare milk-warm, by pouring it into her nostrils, and holding them up, and stopping them close, till she strain her whole body, and it will presently give her ease.

When you intend to wean your foals, take them from their dams over-night, and drive them into some empty house, where they may rest, and the mares be free from their noise. On the morning following, give to every foal, fasting, a sprig or two of favin rolled up in butter, and let him fast two hours; then give him a little meat, such as grass, hay or chaff, with some clear water, and repeat this management three days successively, when he will have forgot his dam. Then geld such colt foals as you intend to make geldings; and after their swellings are past, put them with your other colt foals in a pasture by themselves, and your fillies into another by themselves. These pastures should be spacious pieces of ground, where they may run till they are fit for the saddle.

Of

Of the Feeding, &c. of Horses.

Thin-skinned horses, that have been well kept and cloathed, should never be turned to grass above three months in a year, viz. from the beginning of June to the end of August; but thick-skinned horses have strong coats, which keep out the weather, and if well fed will lie abroad all the year. Walking about to feed prevents stiffness in their limbs, and treading in the grass keeps their hoofs moist and cool; however, they should have a hovel to come to at night, or when it snows or rains. This conduct should be attended to, as preventing the chief of their disorders, such as colds, the glanders, inflammations of the eyes, swellings in the body, &c.

Horses in general may be taken into the stable in October, or November; according as the weather is more or less rigid. They must be well littered with wheat straw, while they are fed with hay; but when they eat straw, they waste a quantity almost sufficient to litter them.

Lucerne is a proper summer food for horses; it will go farther than any other grass, and be much better for them. They will eat it green, if well fed, till the end of October; and be in good condition with it for constant hard work. Straw, or chaff, with carrots chopped, and given in the stable, is a good winter food, from October to February, and the horses are as strong with it as when fed with oats; besides, the carrots are found much cheaper as a food, where the land will produce them. From the middle of February to the end of May, hay, with some oats, is to be their food.

2. OXEN, COWS, AND CALVES.

Descriptions of the best Cattle for the Purposes of Brood, &c. to be observed in Purchasing.

WHEN you buy cattle, whether for brood, for draught, for the pail, or for fattening, your first care should be to have them young.

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For

For the purpose of brood, bulls and cows should be of the same country, and as nearly as you can of the same color, red before all others. The bull should have a quick and sharp countenance; large and white horns; hairy and rough ears; a forehead broad and curled; large and black eyes; large and white jaws; wide and open nostrils; blackish lips; a dew lap, extending from his nether lip to his fore boots, large, thin, and hairy; broad and deep shoulders; large and broad ribs; a long and large belly; a back strait and flat, even to the setting-on of his tail, which should stand high, be of a good length, and bush-haired; round huckle bones, making his buttocks square; round, and well trussed thighs; strait legs, being short-jointed and full of sinews; round, strait and large knees; feet one far from another, not broad nor turning in, but easily spreading; long and hollow hoofs; his hide neither hard nor stubborn in feeling, and all the hair of his body thick, short, and soft as velvet.—The cow should have nearly the same marks; but particularly she should be young, as a cow is unfit for brood after she is twelve years old; her stature should be high; her horns well spread; forehead broad and smooth; body long; belly round and large; udder white, not fleshy, but large and lank, and the teats not more than four in number.

For draught or labor, the cattle should be rather of a high stature, and long bodied; sound in tail and pizzle; and the hair neither broken nor staring. However, the black sort, though commonly of a small make, is found to answer exceedingly well for labor.

For the pail, cows of the white and red colors are generally most profitable; but those of the latter produce richer milk and a larger quantity. These should be young; high in stature; long bodied; with a large and round belly; large, fair and smooth horns; a broad and smooth forehead; udders white, not fleshy, but large and lank, with four teats only.

The younger the oxen or kine are which you buy for fattening, the sooner they will feed. They should have smooth hair, be well mouthed, and want no teeth,
for

OXEN, COWS, AND CALVES. 91

for if they do, though they should be broken both in tail and pizzle (either of which is a sure sign of a waster), they will feed; they should have broad ribs, thick hides, and loose skins, for if they are hidebound they will not feed.

Always buy cattle from a poorer ground than that you have to feed them on, and then you may reasonably expect them to thrive with you, but not otherwise.

Of the Management of Bulls, Cows, and Calves, in Producing, Rearing, &c.

There is commonly allowed one bull to twenty cows; and the bull is not to serve above two of them in one day.

Some advise the spring as the best time for going to bull; others the end of July. However, from spring to winter is the period generally adopted, as answering the beneficial intention of always having some to milk.

In their copulation, care is to be taken that cows are three years old at least; if they chance to be with calf before that age, they must be milked for three days, to prevent their udders being sore, and the calf separated from them.

The cow is not to be too fat at bulling time, nor during her pregnancy; she may therefore be kept in a short pasture, while she goes with calf: but as the bull is required to be strong and vigorous, no pasture can be too good for him. If a cow be fat at calving time she will be in danger, and the calf will be less.

You may either wean calves at ten or twelve weeks old, or let them run with their dams all the year; which last method produces the best calves. If you wean them at ten or twelve weeks, a fortnight before give them some water put into milk luke-warm to drink; and, if it be in the spring or summer season, turn them out to graze, which must be short and sweet, not rank. Or, in the winter, they may be fed with fine, sweet, soft hay, put into low racks; and they should be housed in the cold nights,

Calves intended for oxen may be gelded at fifteen or twenty days old (in the old of the moon) for then there is the least danger to be apprehended. Do not let them drink the day they are gelt, but nourish them with a

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little meat. Diet them, for three days after, with the young boughs of elm, and sweet grafs, cut for them; and take care they drink not too much.

Whatever be the purpose for which you rear calves, let them not want store of good pasture, as in that case their growth cannot be large.

Such calves as are slipped in four or five days from the change of the moon, are unfit for rearing, and should be disposed of to the butcher.

Calves designed for the yoke, are not to be broke before they are three years old, for fear of a wrench; nor after five, as being then too stubborn.

If a cow, by lying long on the earth, and too soon drinking cold water after calving, have her calf haulm swell and lie over the neck of the bladder, so as to hinder her from staling, or standing on her feet—Take two sacks, or a window cloth, put it under her body, fasten a rope to it, and put it over a beam in the barn, and draw her up so as she cannot touch the ground with her feet; then let a woman appoint her hand, and work the calf haulm from the bladder, that the water may have a passage. Give her warm bedding, warm drink, and warm clothes.

When a cow cannot clean—Take a large handful of pennyroyal, and boil it in three pints of ale; then strain it, and put one pound of treacle into it, and let it just boil; take it off, put a half-penny-worth of flour of brimstone to it, and give it in a horn to the cow. Instead of pennyroyal you may use southernwood.

If the bags in cows snarl or swell—Take rue and adders tongue, stamp them together, and squeeze out the juice; mix it with a pound of fresh butter from the churn without salt, and make it into an ointment.

When a sucking calf scours—Take a pint of verjuice, and clay that is burnt till it is red, or very well-burnt tobacco pipes, pound them to powder, and sift them very fine; put to it a little powder of charcoal; then blend them together, and give it to the calf, and he will mend in a night's time for certain.

In

OXEN, COWS, AND CALVES. 93

In the Murrain or Plague, use the following Remedy. The herbs angelica and rue, of each a handful, chopped together; tar half a pint, soap four ounces, and salt half a handful; to be mixed together and made into an electary, whereof a quantity the size of a small egg may be given to a beast at a time, rubbing its nose with tar.

To prevent a spreading of the Murrain in cattle, use a fumigation either of tobacco, sulphur, unslaked lime, garlic, coriander seed, or wild majoram singly, or all together, laid on burning coals in chafing dishes, set at proper distances in the cow houses, or among the ox stalls, during the time the cattle are abroad, and so that the stalls may retain some of the smell of these ingredients. Frankincense and olibanum may likewise be burnt on this occasion; and camphire laid here and there about their stalls; besides which be careful to keep their stalls clean.

The remedies for the other disorders incident to OXEN, COWS, and CALVES, are contained in the CATTLE KEEPER'S ASSISTANT, mentioned in the note at the foot of p. 87.

To preserve cattle in health, bleed them spring and fall, except calves, when the moon is in the lower signs; and give them a drench made of the pickle of olives, mixed with a head of bruised garlic; and the calves must not be put abroad to graze too early.

Of their Food, &c.

The winter food for cows is straw, hay, and turnips: they have straw, while they are dry, hay and turnips before and after they calve; and hay alone, while butter is made for them. They require 40lb. of hay commonly in a day; but 50lb. of turnips will be a necessary and improving quantity for them before calving: but cows have their milk improved, and fat faster, with feeding on carrots. Potatoes may be also used as a winter food for cows; and Lucerne is a cheaper summer food for them than any other grass. To prevent butter from tasting of turnips, lucerne, clover, &c. see the different growths. Burnet is a food that gives no disagreeable taste

taste to the milk of cows, but enriches it beyond any common food. See BURNET, and the several cultivations above mentioned, for their various advantages in the article of food for cows. Calves, whilst they suck, may be fed with barley meal, which will render their flesh white, and make them fat.

Beasts fat faster by a great variety in their food, than when kept to two or three; a beast from 30 to 50 stone, with many sorts of food and good management, will fatten in three months; whereas, four months will scarce be sufficient, if it have turnips and hay only. They eat the more, when their food is changed; and the more they eat, the faster and better they fat. For the time to fat on turnips, see TURNIPS. See also CARROTS, and TARES.

3. S H E E P A N D L A M B S.

Of purchasing Sheep.

LET the number of sheep which you purchase be in due proportion to the conveniency you have for their feeding; not too great, as then they feed on poisonous weeds, and perish by the hunger rot; nor too small, as the profit arising from keeping them is considerable; and choose them from such soils as are dry and free from evil plants, and from poorer grounds than your own.

Sound sheep have the following marks, viz. The fibres about the white of the eye will be of a bright red, and the eye full and clear; the gums firm, and the teeth of a fair color; the flesh about the breast of a red or ruddy color; and the wool not easily pulled from the skin.

If you find, on examining their mouths, that their chaps or tongues are mottled with black, the rams especially, do not buy them, for by degrees they will bring you a mottled race, or perhaps many black sheep: The inside of their lips should be red.

In purchasing sheep to improve, first examine if they are sound; then let the ewes which you choose be not
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above two years old, that being their best age for bringing strong and sound lambs: You may know them if they are old by their teeth being worn. The ram, for this purpose, is in his best age from four or five to seven years. His fleece should be white, deep, greasy and close; his body large, forehead broad, skin of the same color with his wool, eyes full and ruddy, ears large; shoulders, breast and haunches broad; testicles large, and his tail broad and long. The ewe is to be full-bodied, deep-stapled, and the wool thick and curled on the upper parts of the body, especially the neck and the head, the belly should be well covered (for where wool is wanting in these places, it is so bad a sign that no husbandman of judgment will buy them); the neck should be long, and the legs short, and then they will feed better, and see better how to distinguish their food.

Sheep that are big-boned, and have a long, greasy wool, curling close and well, always breed the finest wool, and are most approved by the butcher for sale in the market.

Black sheep are on no account to be chosen; their flesh is coarse and ill-tasted, and their wool, when wrought, will change into an ugly color.

Of the Management of Sheep.

TO keep a flock in good order, examine it once or twice a year; and when the winter or bad weather has carried off any sheep, renew them from sound flocks, and as nearly of the size and goodness of your own as possible.

It is very certain, that sheep improve best by changing their pasture often. When sheep are distempered, let them have a pasture, distinct from the rest, of good fresh grass; and as they get better sell them off. Also, such sheep as appear not to prosper in your grounds, you must remove.

Let the sun shine an hour or two upon the grass ere you turn your sheep out of fold; and then chase them with your dog gently up and down till they are weary, before you suffer them to feed.

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In the course of their feeding, let them range on low rich dry lands at the dry time of the year only; but turn them on the highest and driest grounds in wet seasons; also, keep them from such grafs as is made gritty by the overflowing of water; and with this conduct you will preserve the flock in foundness.

It is hazardous to venture sheep from a small bite to a rich pasture too suddenly, for that often brings on them the mortal distemper, called the red water.

When you feed them on fields of wheat and rye, if these are too rank at first, the sheep will likely be thrown into scourings. It will also be hurtful to let sheep feed upon fallows, whether the land be light or strong; for where the land is light, they frequently pull up the herbs by their roots, and eat the roots with the dirt that is about them, which will assuredly give them the rot; and if the fallows are strong land, and there should not be grafs enough for them, hunger will force them to eat unwholesome herbs that would give them the hunger rot, which is the worst distemper of all, as the skin will thereby become unprofitable as well as the flesh.

Those grounds where the spurwort and pennywort grow, are always too wet and moist for sheep.

Ewes that are big should be kept but bare; for it is very dangerous for them to be fat, at the time of their bringing forth their young. But they may be well fed a fortnight before hand, to put them in heart.

AS the good conduct of sheep in their *Rutting* and *Yeaning*, is conducive to the health and preservation of themselves and offspring, the following observations for that purpose may be found useful and proper.

The strength of the flock depends much on the good qualities of the sire and dam, and the season they are brought to blossom in.

If your pasture be good in winter, and spring early in the year, you may let the ewes and rams run together all the year about, to rut when they will; but if the pasture

pasture be only grafs in common, then the best time to put the rams to the ewes, is in July: Further, where there is only a run of sheep upon a common field amongst the arable, then it is time enough about Michaelmas; or, where the country is mountainous and rocky, and nothing but heathy ground, the end of October will be the properest time. The reason of this is, the ewe yeans in the twentieth week, when it is necessary she should have the benefit of springing grafs, as that will afford her plenty of milk for the improvement of her lamb or lambs; for some ewes will bring two, three, or four at a time; and where good nourishing food is wanted at yeaning time, many lambs are lost. It is therefore needful you should contrive to bring your sheep to the blossom, at such times as you judge your pastures may be in the best order to receive the lambs when dropped, that neither the ewes nor the lambs receive prejudice by a want of sufficient food. In a word, the best time for ewes to lamb in, if they are pasture sheep, is about the latter end of April, and so to the beginning of June; but if they are field sheep, then from the beginning of January to the end of March; so that the lambs may be strong and able before May day, to run with their dams over the fallow grounds.

Of Yeaning of Lambs.

EWES, at the time of yeaning, should particularly have the benefit of springing grafs; as that will afford them plenty of milk for the nourishment of their lambs, which they will otherwise forsake, and through weakness endanger their own lives with those of their lambs.

As soon as a lamb is fallen or dropped, examine it, and if it be like to die, open its mouth, and blow therein, and it will recover; or, if a lamb be not so strong as it ought when newly yeaned, house it with the dam. If the ewe be weak likewise, she must immediately be put to good nourishing food, which will soon produce milk for the lamb, and the lamb, in the mean while,

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should be put to suckle of another ewe, which if he refuse, milk into his mouth from the same ewe; and if this will not do, anoint his lips with hogs lard beaten up with a little milk, or fresh butter, which last is the best of the two.

A good shepherd is very much wanted about the time that the ewes drop their lambs; for sometimes they have need of help, and especially if ravens or carrion crows by chance fly over a pregnant ewe while she is yeaning. For if a shepherd be not then present, and either of these birds be in sight, they will assault the lambs even before they are quite fallen, and pick out their eyes, notwithstanding the ewe's endeavors to drive them off.

Of Weaning of Lambs.

WHEN a lamb is to be kept for breed in a good common pasture, wean it at about sixteen weeks old, to make it strong, and the ewe will have strength, and may go to blossom quickly. And when the sheep are upon a poor pasture, as in the mountainous, rocky countries, then the people generally wean their lambs at about twelve weeks; but these lambs are never so strong as those which suckle as long as the ewes will suffer them.

The more hardy a sheep is bred up for the pasture, the better, so as care is taken not to let it want provision in the first part of its life.

The sheep which you design to keep for rams, should be those of which the ewe has two at a birth, as being the strongest for the rut.

Of Gelding of Lambs.

THE wether or gelt sheep will be larger than those which are not castrated, and will endure more wet without rotting, than the other sheep of either sex.

The age of cutting is from three to nine days old, after which they grow more gamesome, and the wound is healed with greater difficulty. In cutting, let one hold the lamb between his legs or on his lap, and turn the

the lamb on his back, holding all his feet upright together; if you see black spots on his flanks, do not cut him, as the operation may cost him his life. Let the cutter hold the tip of the cod in his left hand, and with a sharp pen knife cut the top of it the length of an inch quite away: Then with his thumbs and fore fingers, let him slip the cod softly down over the testicles and holding the left testicle with his teeth, draw it gently out as long as the string is; then draw forth the other in the same manner. After which, spit in the cod, and anoint his flanks on both sides with fresh grease, and let him go.

FOR *Shearing of Sheep*, the best time is about the latter end of June, because it is good for them to sweat in the wool before it is cut. They must be very well washed before the shearing, for this is a great addition to the price of the wool; after the washing let them go three or four days in a clean dry ground. When they are cutting, the shearer must be very careful not to wound their skins, because then the flies teaze the poor creatures in a terrible manner. Some shear their lambs the first year, especially behind; but before this is done, they ought to be carefully tagged, that is, their tails and thighs behind should be well cleared of the wool, that the dung may not hang there, which else makes them sore, and subjects them to the flies, which then blow, and make them full of maggots.

If sheep are put indiscriminately together, the strongest will hurt the weakest, and not suffer them to pick the food that might be the most nourishing for them; it is therefore necessary there should be a distribution or separation of them, which cannot be better made than at the time of shearing, when it will be very easy to discover which are strong and which are weak.

The sheep which you design for feeding or fattening should be put by themselves. Thus,

The ewes by themselves; the wether hogs and theaves by themselves, (the hog is a male of one year's growth,

the theave is a female in the second year); the lambs by themselves; and the wethers and rams by themselves.

Of their Food.

THE turnip feeding of sheep being over (which generally terminates with March), a spring food is to be given them. The turnip cabbage is a most useful cultivation for this end, which may be cut early in April, and will last very good till the middle of May. This period includes the most difficult time of providing for them in the whole year. Lucerne may also be a spring food for sheep, as it is, in general, fit for them the first week in April, and thus this crop will be profitably applied. Either of these crops exceedingly well suit the keeping of sheep; the first should be large enough to last the flock a month from the end of March, if lucerne be on the farm; and the rest of the time, till the middle of May, they may be fed with this grass. But if there be no lucerne, the growth of the turnip cabbage should be extended in proportion for six weeks. Sheep are to be suffered in the field no longer than the leaves of the lucerne appear sufficient for a bite. Hay is not a good spring food, especially for ewes that are breeding. Common pasturage is most agreeable to sheep, for summer food; though they will feed heartily on lucerne, saintfoin, and clover, when that cannot be had for fattening them. Plenty of grasses for sheep food, is the most effectual way of guarding them from their dangerous disorders. Turnips and hay may serve as a winter food for sheep; but they must be plentifully fed, or their rearing and well doing will be precarious: They are assisted, at this time, with a run about the farm. For a peculiar food for sheep, see BURNET.

A Remedy for the Rot, or any infectious Distemper in Sheep; which is also effectual, if given as directed, for preserving them in Health.

TAKE the berries of juniper well dried, and beat them small, or (for want of them) young tops of juniper dried

dried gently in an oven, beat fine and passed through a sieve. Put two drams of this powder to half a bushel of oats, and to that add about a quarter of a pint of common salt; mix it well together, and give it your sheep in wet weather, or in any contagious time, to keep them in health. You may give this medicine three or four times a year; and it is remarkable, that when sheep are in health, they will hardly taste it, unless they are shut up in a pen, and kept from other meat; but if they are inclining to the rot, or any other inward distemper, they will readily eat it. This remedy may be given for a day, or for two days at most, giving dry hay besides. It is observed in favor of the above medicine, that where the juniper grows frequently, sheep are never subject to the rot.

The other disorders of SHEEP are enumerated, with their treatment, in the CATTLE KEEPER'S ASSISTANT, mentioned p. 87.

4. H O G S.

Of the Nature, Use, and Choice of Swine.

THE hog is a hurtful and spoiling beast, stout, hardy, and very troublesome to rule. However, he is a profitable creature, where there is convenience to keep him. In farms, where there are large dairies, it is necessary that to each cow there should be a hog; for the offals of the dairy, such as skimmed milk, or flit milk, butter milk, whey, and the washing of the dairy, afford sufficient food to nourish them.

The best Swine (both sows and boars) for breeding, are chose by the following appearances, viz. Long and large bodies; deep sides and bellies; thick necks and thighs; short legs; and thick chine, well set with strong bristles. The sow should have only ten tets or paps, or twelve at most. With respect to their color; the white or sandy are esteemed the best; the pied are considered the worst, as being most subject to the measles.

Of

Of their Management.

ONE boar is to be allowed to ten sows, and both to be a year old before they are suffered to couple.

A sow usually farrows in the seventeenth week, and may have three litters in a year; but it is better not to let them take the boar every breeming time, that the pigs may derive no weakness from their want of strength to suckle them.

Take care that the sows are not too fat at farrowing time; but feed them plentifully afterwards, that they may give the better nourishment.

The best breeming time is, with some, from November till the end of March or beginning of April. If a sow miss the breeming time, or seem not inclinable for the boar, parched oats in her morning or evening's food, or the small end of a rennet bag, will incline her to receive him.

Great care is to be taken of the sows when with pig, and to shut them up in the sty to avoid accidents. Two of them should not be put together, lest they lie one on another, and hurt themselves. Let them farrow in the sty, otherwise they often cast their pigs, which is a great loss to the keeper.

If the sow bring a great number, she may be helped by the owner's feeding the pigs now and then with warm milk and a little coarse sugar in it, as they may conveniently be brought to take it.

When a sow has brought a fare of pigs, barley made soft in water may be given her; it is a cooling diet, and will nourish her, and much strengthen her body. To keep sows from doing harm, or becoming mischievous at farrowing time, let them have water, besides a plenty of milk, or the best wash of the dairy, which you may think proper to allow. The wash of the dairy should be preserved for sows when they pig, and their young; and not given to hogs in common.

Young sows especially should be watched, that they do not eat their pigs when they are about to farrow.

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Or, as a preventive, feed the sow very well a few days before her expected time of farrowing; or, if this have not been done, wash the backs of the pigs with a sponge dipped in an infusion of aloes and water warmed.

When your pigs are to be weaned; in the absence of the sow, feed them with the best milk you can spare from the dairy; and though you begin with giving it warm, you may, at three weeks end, serve them with cold, if you design to rear them; and they may then, at a month at farthest, either be fed alone, or keep company with the sow abroad. It is advised, in order to rear fine pigs, to keep the sow littered with clean straw, and her sty free from all manner of filth.

Sows breed till they are six years old; and the boar at five is deemed of no further service for generation. They are, therefore, at the above ages, put up to fat or brawn, &c. But if the boar be gelt, he will then make good bacon.

The pigs farrowed in or near Lent, and in summer, are best to rear; as in winter the cold pinches them, and keeps them back. Then, having chose out the best for sows and boars to breed on, geld all the males and spay all the females you design to rear; for so both will make the best hogs to rear, and yield more lard. The boar pigs ought to be castrated when they are about six months old; for then they begin to wear strong in heat, and will make the stronger hogs: This should be done either in the spring, or at Michaelmas, and as follows: Cut a cross slit in the middle of the cod over each testicle, then pull them gently out; and anoint the wound with tar. But sows should not be spayed till they are three or four years old; to do which, cut a sow in the mid flank, two fingers broad, with a sharp pen knife, and take out the bag of birth, and cut it off; then stitch up the wound again, and anoint it, and keep her in a warm sty for two or three days; then let her out, and she will soon grow fat.

Swine are not to be suffered to feed too rashly, nor served with too great a plenty before they are put up; but such a moderate diet is to be given them, as will
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just keep them in a good state of body, and prevent them from being over-ravenous. If swine range about in the day time, and eat too much fresh grass, especially in the spring, they will be liable to the distemper called the gargut; wherefore, so long as you turn them out, use them to a feeding every morning and evening, and your fears may be less.

Hogs may be cheaply fed in winter on Jerusalem artichokes; and in summer, clover is a proper food for them. Carrots and chesnuts also become parts of their food, which see, with the cultivations just mentioned, under their respective heads.

The chief hindrance to the thriving of hogs, is, letting them lie in the wet. If the hair of your hogs stare and look rugged, which is an instance of their not being in a thriving state, take half a peck, or more, of ashes, boil them into lee; then cause such hogs to be laid on a form, and wash them with the lee; and curry them with an old currycomb, till you find all the scurf removed from the skin; then wash them with clean water, and strew dry ashes over them; and this will kill the lice, and cause the hogs to thrive well.

A Remedy for the Pestilence or Plague in Swine.

LET each distempered creature be separated from the herd, and put into some house where none but the infected may come; and give it, as in all other disorders, clean straw. Then take some roots of the poly-pody of oak, and ten or twelve bruised berries of ivy, and boil them in a pint of raisin or good white wine. Give this medicine, which is a purge, and it will correct their stomach, and discharge the malignity.

The house or sty is to be cleansed from the dung and straw of one infected swine, before another is brought in; and after the first, the new-distempered swine are to have some bunches of wormwood, fresh gathered, to feed on at pleasure.

The general treatment of their disorders may be found in the CATTLE KEEPER'S ASSISTANT, mentioned at p. 87.

CHAP.

C H A P. XII.

P O U L T R Y.

I. P H E A S A N T S.

THE pheasant is easily and profitably maintained by the farmer, he having various fresh fields of corn or grass to turn them into, which are very necessary to their rearing; and these birds thrive well on the insects, toads, snails, &c. which they find on such land, at the same time that they do service by clearing it.

The places for their keeping is usually in a yard or ground, which is to be well fenced from cats, dogs, vermin, and, if possible, from every kind of disturbance, since they receive prejudice thereby: they must be provided also with shelter from bad weather, and for retreat when frightened; likewise, places to secrete their eggs from kites, crows, &c. which suck them on discovery. These places may be large or small, according as conveniency may best admit; but they need not, in general, be large, as the breeding of few broods is better attempted, than a great number, because the obtaining their means of subsistence when very young is attended with trouble and difficulty; and altering their food will kill many of them.

For the breeding stock, one cock is allotted to five hens; which are to be kept as a flock separately during the time of treading and laying; and if there are more flocks, each is to have a different apartment. The hens should, particularly, be no more than one year old; for young hens have more eggs, and lay earlier; and the earliest broods are the best. Great care is to be taken of these eggs, and to remove them as soon as the hen has hatched them; they are also to be kept clean, free from bruises, and safe from heat, or chilling moisture, in bran or corn, or something soft, where they are sometimes to be turned.

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When you have a sufficient number of the above eggs, that are without any of the defects just mentioned, and not kept long after laying, set them under turkeys or hens, if they are ready, in some safe place; but as these are less than the turkey or hen eggs, their number must be increased.

The young are hatched in May (but the time should be well known by such as look after them, in order to make proper provision), when the turkey or hen must be put into a box fifty-six inches long, thirteen inches deep, and thirteen wide; with a partition for the turkey or hen, twenty inches from one end, divided from the other part of the box with bars three or four inches apart, for the young pheasants to go out to feed. The turkey or hen must have her meat and water within her reach; and the box which contains the young pheasants food must be covered with a net, to hinder the sparrows from pecking their meat.

The pheasants are to be kept in this box ten days, during which time they must be provided with the following as a food, viz. black-horse emmets eggs, or some red emmets eggs, gathered from woods, or the sunny side of ant hills in pasture grounds; of these the black-horse are best, if they are dead, otherwise they sting the pheasants, which then reject their meat till they starve.—The way of killing the emmets, is, to put earth, eggs and emmets together into a barrel, till it is half full, or thereabout; then put in some lighted brimstone rags, and cover it close; shake it often, while the smother of the brimstone remains; when this has been done, put some of the same rags with brimstone a second time into the vessel, with which the emmets will die, or be so much weakened as to be easily killed, or separated from the eggs. When the eggs are thus prepared, and the emmets are killed, pick them clean from the earth, and throw a few at a time, every half hour, into the feeding part of the box. They may, however, be fed the first three or four days after hatching with red emmets eggs; and these em-

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emets need not be killed, as they will do the young pheasants no harm. But it is difficult and troublesome to get enough of them, they are so exceeding small; and therefore they must have besides, for the first six days, while they are in the box, a paste made of barley flour beat up with an egg and the shell of it, without water or any other liquor, and so stiff as to bear making into pellets of the shape and size of the black ants or emmets egg. These pellets are to be made only while they are feeding on them; and when they desist, throw some emmets eggs, and these will create a fresh appetite. The first six days, give them (no water, but) milk in a shallow tin pan, and let it not be sour. The seventh day they may have water with their milk, in like quantity; and then their paste may be made of milk and barley flour, with some fine powder of egg shells, but none of the egg. About the tenth day, take them out of the box, and set the hen under a coop upon a green plat, at the same time making a fence round the coop, five feet in the clear, and two feet high, either of wires, boards, or other applicable things. This fence is to keep the young from wandering too far from the hen, before they are strong enough to encounter with weeds, &c. which annoy and oppose them in their advances. They may now drink all water, and their paste may be made of barley meal, water and egg shells powdered, after which, they must, at every feeding, have emmets eggs.

When they have been confined on this grass plat seven days, change them to a fresh one; and give them liberty to run or fly where they please, till Michaelmas: They will not leave the hen, unless frightened beyond recovery of their knowlege by dogs, &c. but they may, in this case, easily be called together again by the hen, or a whistle, which should be used to collect them every time they are fed. By this time the pheasants will be able to feed on the emmets, without the trouble of killing and preparing them; though this must not be left off but by degrees, till the pheasants are found to thrive

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with the insects; and they must be fed as before till there is new corn, when a little of it in the ear may be given them, and afterwards some peas.

The boxes are to be set in dry grounds, away from a north wall, because it has little sun; as also from one that is southerly, because it has too much; but a west wall answers, and place them near this, if you can; and if you cannot afford them a wall, they must be screened on the sunny side. Likewise, some shrubby bushes must be provided for the pheasants to run under, when they begin to ramble from the hen.

If the month of July be wet, the young pheasants must be housed every night, an hour before sun-set; and let abroad early in the morning.

Towards the end of August, the early brood of pheasants (or partridges) will be strong enough to pinion, which secures them effectually; this is done as follows, viz. pick the feathers clean all round the first joint of the wings, and then tie a thread tight a little below the joint to stop a bleeding when you have cut off the pinion, which must be performed with a sharp knife. When this operation is over, they may be turned loose; but watch them about an hour at first, and if they bleed, sear the wound with a red hot tobacco pipe. The late broods need not undergo pinioning till September, when their strength will be more equal to it.

To make the breeding pheasants lay early, begin in March to feed them with paste made with barley meal and eggs with their shells well beaten, and water.

Their food must be clean sweet oats, wheat, or other grain, but let it not be musty on any account; and it must be carefully given them, so as to be without taint or mixture of their dung; and their water must always be fresh. Their inclosures will be better for plants or weeds growing in them, if they are such as they will feed on; and the French furze, if sown in them, will afford good shelter.

Take care to keep them away from wall trees, for they will peck off every bud to two feet, or as high as they can reach, and leave the wall bare.

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They will eat toads greedily, when of a size convenient to be swallowed by them, and thrive well by that variety in their food; but they will not touch frogs or newts. Ducks, on the contrary, reject the former, and eat only the latter sorts.

The last year's pheasants, after laying time, are usually fattened for the spit.

Pheasants designed for wild stock, to breed in the woods, should not be turned out till winter is over, as they then ramble away, and become the prey of foxes, or sport of gunners. The wings of these are not to be cut; and therefore their apartment must have a net covering. The common color is best for the wild stock, the white marks, if there are any, exposing them too much to the sight of their enemies. The pied sort, which are mostly kept for pleasure, are all of a similar nature; but the quite white are visibly less and more tender. If they are not designed immediately for stocking the woods or covers with game, their wings must be kept clipping from the time they begin to fly.

Partridges are bred in the same manner as pheasants.

2 T U R K E Y S.

THE turkey is a bird of a very delicate and tender nature, consequently the rearing of it depends upon much care and attention. To succeed in the breeding of turkeys, let the young ones have a whole pepper corn each, with a little milk, as soon as they are hatched; and keep them in a barn or out house for about six weeks afterwards, as well to cherish and bring them forward, as to guard them from eating small snails and slugs, which they find abroad, for these always bring on them deadly scourings.

Provide a place inclosed with wicker (to prevent their ranging), where they may have a moderate heat from the sun; into which put the young ones when they are six weeks old. They are to be fed often with rotten eggs boiled very hard, and clivers, or wormwood, chopped small and mixed with them; or with new-made
cheese,

cheefe, cut in small pieces; with new milk, or milk and water, to drink. At their first coming abroad, two hours in the air, at a time, will be sufficient; but this may be increased, as they grow older, and more able to shift for themselves.

It is necessary that a fresh turf of short grass be given to the turkeys every day, soon after they have hatched; but first carefully free it from snails, or slugs, to avoid the evil above intimated.

They generally lay in March; and, if they range, will likely lay their eggs abroad, in secret places; but bring them early to a habit of laying at home, for the security of their eggs.

The hen sits in April, with eleven, twelve, or thirteen eggs under her. Her time of sitting is twenty-five days, and she hatches between that period and thirty days. She is extremely negligent of her young, therefore look well to them yourself; and keep them warm, without which they will neither thrive, nor even live. When the young have arrived to a tolerable degree of strength, you may feed them in the open air; but an inclosed place is the properest, as it prevents their straggling.

Never let turkeys out to range till the sun has dried up the dew from the grass, nor suffer them abroad late in the evening, both of these being prejudicial to them. They devour great quantities of corn, if fed with it; but when they are full grown, they thrive well with herbs, seeds, &c.

Turkeys may be caponized; and they will therewith be of a larger size, and their flesh much finer.

To fat turkeys, give them oats or barley well baked, during a fortnight; then cram them in the same manner as used with capons, for another fortnight, but let it be in the morning only. They may be permitted into the air in the day, and must occasionally be fed with corn.

3. G E E S E.

THERE are variety of advantages redounding from the breeding and keeping of the goose, which are made more

more considerable on account of the little attention and outgoing required for their feeding.

Geese are chosen either of a white or grey color; the rest are deemed inferior of their kind, as they approach more to a deep-colored or dirty feather. The largest breed is the best; and five geese are in general allotted to a gander.

The time the goose is about to lay, is denoted by her carrying bits of straw in her mouth; and she shews herself disposed to sit, when she remains on the nest some time after having lain an egg.

While geese are sitting, oats and scalded bran are to be placed for them every time they leave the nest, together with water for their refreshment. Their time of sitting is a month, unless in warm weather, when they hatch in about twenty-eight days. Since each fowl knows her own eggs, and it is proper to place those under her; if you have eggs from several geese, you should mark them as they are laid, and you will save a deal of confusion and trouble.

The young goslings are kept within, ten or twelve days after they are hatched, to prevent their taking the cramp, which often kills them. Their food, at first, may be raspings or crusts of bread steeped or boiled in milk; bran, curds, or barley meal. When they have got some strength, they may be permitted into the air, for three or four hours at a time; but care must be taking that they do not range so as to fatigue themselves too much, and likewise to house them before the cold of the evening comes on. Guard them from henbane, by rooting it up; for if it grow in any part of their range, they may eat it, which would poison them.

As the young geese and ducks sell well at particular markets, you may force them to lay and sit early, by putting them in a covered place, feeding them well, and allowing them every day, early in the morning, some water in a large tub.

You may put green geese up for fattening when they are about a month old, and by the end of another month, they

they will be fat enough for killing. During the time these are fattening, a small rack of fine hay may forward them to a great degree. Geese of six months old, or thereabout, may be turned upon the stubbles, as soon as the corn is carried into the barn; which, with a little barley in water when they come home, for a few days, is a common way of fattening them for the markets.

If you would have your geese to be extraordinary fat, coop them up, for a fortnight or three weeks, where there is little light, and where they may be out of the hearing of the other geese. Let them be fed with ground malt in water, or ground malt and bran, or ground malt and wheat flower mixed with water, as thick as pap; allow them, besides, a pan of water, with some gravel in it, for water helps to fatten them.

It is remarked of geese, and other water fowl, that they have a small bunch of feathers which stands upright upon their rumps, and is continually moist. If this be not removed, by cutting it away, the bird, while fattening, will sit with her bill upon it, and suck the moisture, which is part of her own fat; and thus require a longer time, and more food for fattening.

When geese are ill, which, if at all, is about Michaelmas; they may be recovered, and kept well and strong, by feeding them with rye.

If a goose be troubled with the Gargil, which is a stoppage or stuffing in their heads; beat three or four cloves of garlic in a mortar, with sweet butter, and make little long balls of it. Give two or three of them to a goose while fasting, keeping her shut up for two hours after, and they will effect a cure.

4. F O W L S.

THE cock is to be large for his kind; full-bodied, well-shaped, lively, and sturdy in his appearance. The hen is to have the same marks in general, but to be mild in her aspect, and of a size corresponding with that of her companion. However, such only as are famous
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for laying and breeding, should be a rule to determine purchasers. Hens with tufts of feathers on their heads, are preferable to those with combs; also, those that crow, are remarked as being less profitable in laying and breeding. Hens with hinder claws or spurs, are said to break their eggs with them frequently, and otherwise to be of a vicious nature.

The hen houses are to be strong, large and roomy, well secured from vermin and all hurtful intruders, and kept clean and dry. They should be so contrived as to afford the fowls the benefit of the morning sun, and as airy as possible; this may prevent the fowls from taking the roup, which happens from the scent of accumulated dung and filth. In point of situation, nearness to a bake-house, or like building, is the best; the warmth of the fire and the smoke have agreeable effects on fowls, and produce healthiness. Their nests are to be bedded with straw (hay makes them faint); and the straw is to be dry and clean, and disposed with some attention and neatness; which is also to be done every time they leave the nest, and the eggs returned to their places. Keep the cock from the nest, for if he get to it, and sit on the eggs, he will likely break the eggs and disgust the hen thereby. In placing their nests, let them be at a convenient distance from the perches, which should be so constructed, as that they may ascend and rest easily upon them.

Poultry and turkeys will get best part of their living themselves, provided their range be any way proportioned to their number, worms, seeds of herbs, and the like, sufficing them. Hemp and nettle seeds are good to promote laying of eggs, therefore a little should be mixed with their oats or barley, which must be carefully given them at set times; to make up the fill of their food. The morning, and just before they go to roost, will answer best, to keep them in order. Star-grass or spurry, which grows about a foot in height, is recommended by some as a serviceable plant for the swarth of a poultry yard, as it causes the hens, which

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are very fond of it, to lay and set early. The feed is of use in fattening any kind of poultry.

One cock is allotted to six or seven hens, in order for strong chickens. If therefore you have twelve hens, and two cocks, and six turkey hens, and one cock, they will require about half a bushel of barley in a week, for one half year, and a bushel in a week the other.

Geese, when they have once chosen a nest, will never lay from it; but take care of the other hens and turkeys, for if they are suffered to range in the morning before laying, they will deposit their eggs abroad, and you may perhaps lose them.

When you design to set a hen as she lays her eggs, put them up in dry bran; and at no time set under her more than she can well cover. A mark is to be put upon the upper side of each egg, and such as the hen has not turned, when she goes from the nest, are to be turned for her. If the hen eat their eggs, put chalk shaped to the size of an egg into the nest, and they will leave this custom off.

The setting season is early in the spring or summer. You may, if you desire, set the eggs of turkeys, geese, or ducks, under a hen with her own; but you must put the former into the nest nine days before the latter. In February or March, when hens cluck for setting, choose the eggs from good breeders (which should always be new-laid) as near of a size as possible, and particularly from some that are little more than a year old; but not of the largest sort, as they mostly have two yolks, and produce imperfectly.

For hatching, use the old hens, but let them not be fat; a fat hen is ill disposed for laying or breeding. Old hens will cover a nest closer, bring a better brood of chickens, and be more careful in bringing them up: besides, it were ill husbandry, to stop the profitable laying of a young hen, by setting her upon her first eggs, when there are others that are fit for no other purpose, and will also do it better. A hen hatches about the one-and-twentieth day of setting. Their
feeding

feeding at this time must be moderate; if less than enough or excessive, they may suffer from it.

A hen must never be disturbed when she is set, and her food and water must be given her; but not placed so near the nest as to enable her to peck while she sets, for if she do, the eggs will not have sufficient heat to hatch them.

If a hen die, or the brood otherwise become motherless, mix these with the chickens of a hen that are about the same age, and she will take a like care of them.

It often occurs, especially in large broods, that some chickens are hatched a considerable time before the rest, some times a day or two. If the hen be careful in this case, nothing better can be done than to leave them with her; but if she be restless, and seem troubled with them, put them in wool, or in a little meal in the bottom of a sieve, and set them in reach of the warmth of a fire, if the air be cold, where they must be nursed till she has hatched the rest, and can take these under her care. Nothing further need be done for them during this time, than to keep them warm; as chickens require no food the two first days.

A mixture of white-bread crumbs and small oat meal, part of which is to be steeped in milk, and the remainder kept dry, may serve well to feed the chickens with at first; give them a little at a time of each sort, as they follow the hen. When they have been fed thus a while, and have got a little strength, let their food be bread steeped in milk, and the like; and the hen will now be able greatly to assist in providing for them. But take care to give them good and clean water; for the drinking of foul water, is followed by divers diseases. After ten days (even in cool weather) the chickens may be allowed to go about with the hen; in hot seasons they must be much abroad.

By a new-discovered method, it is said, chickens may be reared in two months to be as large as full grown fowls; the method is as follows, viz. Take the

chickens from the hen the night after they are hatched, and feed them with eggs boiled hard, which are to be chopped and mixed with crumbs of bread, in the same manner as for larks and other birds, for the first two weeks; then give them oat meal mixed with treacle so as to crumble, of this the chickens are very fond, and will thrive on eating it as said above.

When chickens can provide for themselves, the hen forsakes them; and that is the customary time for fattening. For this purpose, put them into coops in a darkish place, and there feed them fourteen or fifteen days, with ordinary wheat flour made into paste with milk; or with barley meal, and water with a small quantity of brick dust in it. They should never want water; it helps digestion, gives them an appetite to their meat, and fats them in a shorter time.

In general, poultry are fatted with buckwheat, or barley meal.

As soon as the hen has left the chickens, such as you choose for capons may be gelded, if their stones are come down. These are to be crammed morning, noon, and night, by putting down their throats pellets of a stiff dough made with barley meal well sifted and mixed with new milk, and leaving their crops full every time. Or they may be crammed with pellets of a stiff dough made of wheat flour, in which some slips of fat bacon are rolled, and this method will soon fat them.

When your hens are eighteen months or two years old, they usually produce larger and better eggs, than at any other age; to improve this advantage, feed the fowls plentifully, and give them now and then some oats and fenugreek to heat them; let their meat consist of vetches, millet, and barley, half boiled; also, give them bran mixed with brick dust, and let them have chalk with their other food.

Of the DISEASES of FOWLS.

Of the Pip.—This is a white skin or scale growing over the tip of the tongue, which hinders them from feeding; and proceeds from drinking foul water, and eating hurtful meat. To cure it, pull off the skin or scale with your nail, and rub the tongue with salt.

Of the Roup.—Poultry are often troubled with this disorder, which appears in swellings in their rumps, and in time corrupts the whole body. The cure is, to pull away the feathers, to open the swelling, and press out the core; then wash the place with brine, or salt and water.

Of the Flux.—This comes from their eating too much moist meat. To cure it, give them peas or bran scalded. The contrary to this, is, *The Stopping of the Belly*, when they cannot dung. In this case anoint their vents, and give them small bits of bread or corn steeped in urine.

For Lice.—These commonly proceed from corrupt food, or the want of sand or ashes to rub themselves in. To clear poultry of this, and all other vermin, steep some beaten pepper in warm water, and wash them with it; or wash them with a decoction of wild lupines.

For the Sting of a venomous Worm, &c.—Mix butter and rue together, and anoint the part with it.

For sore Eyes.—Take some leaves of ground ivy, chew them well, and when you have sucked out the juice, spirt it into the sore eye, with which it will certainly mend, and grow well.

5. P E A F O W L S.

THE keeping of pea fowls is attended with little trouble; and when grown, they find all their food in the fields and woods. The peacock is admirable in the beauty of his shape, and in the gaiety of his plumes; and his age is said to be twenty-five years.

Each

Each pea cock will serve seven hens, and must never have less than five; for, if he have less than the last number, the eggs will scarce be prolific, and the life of a hen, or two, may be lost by his excessive salacity or lust.

Many cocks kept together, unless they are all of one breed, will occasion their fighting at treading time, whereby they become prejudiced and weak; if, therefore, you have them of different breeds, you must separate them.

The perches may be four feet from the ground; not more; because the hens, while sitting on them, frequently drop their eggs; and for the surer security of the eggs, straw should be laid pretty thick beneath the perches.

To cause them to breed early, let them have either beans rendered thoroughly warm by the fire and broken to pieces, once in about four or five days; or paste made of bean flour and milk; or barley meal and milk with an egg; or spurry seed; as all these promote their breeding.

In breeding these fowls the most dangerous season, is, when their crests are beginning to shoot from their heads; but this being past, their rearing is easy, and their safety equal to that of the chickens of any other fowl.

Pea hens begin to lay in April; they sit twenty-eight days in hot weather, and thirty days in cool. When their eggs are set under a common hen, the number is to be five to four of her own, if she be of a large breed. After she has set a week, her own eggs are to be taken away, and four fresh hen eggs put under her, which will hatch at the same time with the pea hen's. The eggs must be marked on one side before the hen is set upon them, and carefully turned during the time of setting.

They are to be kept in the house a day or two after they are hatched; and then put in a pheasant pen, which for this purpose should be made larger than common.

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During the first three weeks, they may be fed with barley meal a little wet with water, or the meal of other corn; and sometimes with chopped leeks and cheese curds, after the whey is well pressed out; likewise crusts of bread that have been boiled in milk, the milk being pressed out, may be given them when cold.

They must carefully be kept from rain, till about a month old; at which time, they may be permitted into the field, if the land be dry and open to the sun; but tie the hen by the leg, to shorten their range at first, and keep them within call; and they will then be brought home in the evening with less trouble: however, the hen may have more liberty by degrees, and she will of herself return home with her brood.

The young ones must be put to roost in the house, and at all times carefully guarded from taking cold, by not suffering them to sit on the ground. They may have barley, or other corn, given them at harvest time; and at this time, perches being prepared for them, they may be put amongst other pea fowls.

Those young ones, which the pea hens bring up themselves, run immediately with their dams into the fields, where they find their food if they have liberty. But when pea hens lay and set in some place appointed for them, several hens and their broods should not feed together; because those which have the smaller number, or the smaller chickens, make little account of their own, when they see other hens with more or larger chickens than those of their own breed.

When pea hens are at liberty, they seek the most private places for their nests; for the cocks, when they find them out, will disturb and even tread them, while setting, and thereby destroy the eggs: The cocks will also chase and kill the chickens, if they see them before the crest is formed on their heads, but afterwards they are secure from harm from the cocks. For the above reasons, the cocks must be watched, and kept from doing mischief during the setting of the hens, and till the young ones are crested.

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The breeding of pea fowls for the table is an ancient practice. Their flesh has a remarkable tendency to resist putrefaction, and will remain fresh and sweet long time after they are killed in the hottest season; and, notwithstanding, is as digestible as that of pheasants. And there is a white kind of this fowl, which, though not preferable in beauty of appearance, is of a more delicious flesh than the gay kind. The relish of their eggs is likewise excellent, highly superior to what the pheasant or Guinea hen's afford.

6. D U C K S.

Ducks are kept with very little expence or trouble, their food being a little scattered corn or grains, and snails, slugs, worms, and the herbs of clover, fenugreek, lettuce, succory, &c. which they find in meadows or pastures, where they are suffered to range; but a pond or river must be near them, as their thriving is very doubtful where they have not one of these.

The duck with the bill turned up, is found to lay more eggs, than any of the common sort.

Their season for laying is in February; and they choose a concealed place generally for the nest: but the best way is to make nests for them where you desire they should lay, usually strewing corn, a little at a time, two or three times a day near them, and confining them till near ten o'clock in the morning, by which you will secure their eggs; they will not, after they have laid in it, forsake the nest.

When a duck is inclining to set, let as many eggs be put under her as she can conveniently cover (thirteen is the usual number for a duck of an ordinary size), some of which, at least, ought to be her own. While she sets, place some water, with barley or other corn, at a moderate distance from the nest.

Ducks lead their young to water very soon after they are hatched, because they feed there without trouble; but

but in cold weather, the young ones may thereby take prejudice, and should be with-held from it.

Ducks and ducklings are fatted by penning them up, and supplying them with plenty of water, and grain of what sort you please. Some recommend fattening them with acorns. They are fatted in about three weeks.

In winter, when the ducks cannot get snails, &c. abroad, they may be fed with oats, barley, or other corn, given in water.

The Wild Duck requires for its management and preservation, a piece of ground inclosed with a pond, and covered at the top with a net. Oziers should be planted round the pond, and holes left on its borders for a kind of retreat for the ducks. The wild duck, when she is about to lay, makes her nest and deposits her eggs secretly from the drake, who otherwise would suck and destroy them. When she has once hatched, her diligence in training her brood is very great; and she will only require to be fed with oats, vetches, or scalded bran, soon in the morning, and in the afternoon.

7. P I G E O N S.

PIGEONS, which are kept with little expence in the country, produce fast, and are very profitable to a farmer. Their dung is, besides, reckoned a very choice manure for land, of which forty pair will produce twenty bushels in a year.

There are several sorts of them; but the tame pigeon and the dovecote, stand as the principal for country use: The first of these has a reddish or orange-colored eye, a short tail, and a bill thin and long; the latter is so called from the place in which it is kept, and is neither so large, nor so beautiful as the former.

Young pigeons are purchased at easy rates in May and August, and those are the seasons for buying stock.

In about half a year's time, the young ones are matchable. To pair them, a cock and a hen may be put in a coop with a lath separation, but so as they may see each other well; if, after a while, they bill and

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coo; or the cock call the hen, and she spread herself before him; they are well matched, and will be fond of each other.

A farmer near cities, or respectable towns, will find his account in keeping a number of the large tame pigeons; for though the maintenance of them be expensive, yet, since they hatch early in the season, and the young ones are generally fat, the advantage arising from the sale will be great, and answerable thereto. In the more distant parts of the country, the common pigeon is preferable, because they are kept at little or no expence, and increasing fast, their numbers are thought to make amends for the inconsiderableness of the price they are sold at, when separately estimated.

Tame pigeons hatch within three weeks, and have only two young pigeons at a time, which are fit for the market in three weeks after; but if they are well attended, and plentifully fed, they breed from seven to ten times in a year; that is, all the year, except moulting time. To promote the breeding of pigeons, cummin seed, which is judged of a grateful scent to them, is to be constantly kept in the pigeon house, and mixed with their food about the beginning of January. Spurry seed, mixed with their food, has the same effect.

Tares and peas are proper food for the tame pigeon, and some hemp seed, with which they should have plenty of water; and some gravel is to be strewed about their house.

Pigeons, though they make a deal of filth, are easily offended with too much of it; wherefore you must keep their houses clean. Take care no vermin come near them; likewise prevent the starling, or any other bird, from getting at their nests, for they will suck, or by some other means destroy their eggs. Their houses should be white and neat without, as well as clean within, for their easier discerning and incitement to it, at a distance.

The common blue pigeon, called the dovecote, is more hardy and more prolific than the other kinds, and
therefore

therefore more worthy the regard of the farmer. Should the breed, however, of this sort be deemed too small, they may be cross-matched with some of the common tame sort; but let not their colors be too glaringly distinct, for they will not associate so well in this case; and in matching them, observe what was said above. Some intermix ring doves with the common pigeon, by putting the eggs of the former under the latter. These birds, being once hatched, will thrive with the rest; they besides will endure the severest weather, and subsist almost on any sort of food.

Amongst the pigeons, especially of the tame kind, if the owner have too many cocks in proportion to the number of hens, the cocks will quarrel, and drive each other away, which will lower or reduce the stock.

There is a profitable circumstance in breeding pigeons near those lands where abundance of horse beans, and grey peas are sowed; for these pulse being put in the ground early in the season, by feeding on them, the birds acquire great strength, and hatch their young earlier in the season on this account.

Barley and buckwheat compose a strengthening food for pigeons, and occasion them to lay often. Though the common sort may get their subsistence themselves through the greatest part of the year, they must be provided for in the depth of winter, when snow or frosts impede their finding it: As also about the end of June, the seed of bent grass being now the only food they can procure, and the peas not being sufficiently ripened; besides, at this season the pigeons having many young ones, the seed of the bent grass is not sufficiently nourishing for them.

The pigeon is found to be very fond of salt; which, when mixed with other things, becomes a remedy for most of the disorders it is subject to; and for this reason, more than for keeping it at home, we recommend placing a heap of loam near the pigeon house, mixed with water, or rather brine, till it becomes thin as pap; to which are to be added, a gallon and a half

of coarse sand, a good quantity of bay salt, and some salt petre. In preparing this, if the loam be beat up with water, instead of brine, more salt is required; and if the sand contained in the loam be considerable, the addition to be made must be less in proportion. Clay may serve, where loam cannot be easily obtained; in which case, more sand is used; the coarsest red sand is the best for this purpose. Where there are salt-works near, instead of the above preparation, they make choice of the salt cote.

The pigeon has some times a scale on the back and breasts, which weakens the old ones so that they cannot fly abroad for food, and kills the young ones outright. This may be removed as follows, viz. Take fennel seed, cummin seed, and dill seed, of each a pound; common salt and bay salt, of each a quarter of a pound; and assafoetida, an ounce and a half: mix these with some clay, worked fine, and a small quantity of flour. This composition, being baked in two pots, and set on a stand in the pigeon house, will be picked by the pigeons till they are cured.

8. T A M E R A B B I T S.

THIS creature is of great service to a farm, as its dung is chiefly used to harrow in with barley and grass seeds, which, when bought, is paid for at sixpence the bushel. Each doe is reckoned to pay ten shillings a year clear, and that her dung is equal to what is paid for her grains. They are said to be far more profitable, if kept in hutches, than they are when kept in pits. When they are whole-skinned (that is, when their furr is full grown), such skins will sell at first hand, for five shillings a dozen, if they are of the wild grey kind (which are bought by the hat makers); the white or black, sell for seven shillings; and the silver-haired, for a guinea; as they are then fit for dressing, to be exported with the furr on.

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The doe goes thirty-one days; she will mostly bring six, and many times a greater number; but the dam is suffered to bring up no more than five, for otherwise she is attended with weakness, and the offspring are besides of a small and starved growth. The young ones are commonly kept with the doe two months, in which time they will be fat enough for sale; and she may at five weeks end take the buck, that the former brood may go off about a week before she kitts.

You may save young ones for breeders in March, which is deemed the best time; and then, with good meat, clean usage, and close attendance they will take buck about the end of November, and you may enter the season with their first litter. The season continues from Christmas to Whitsuntide,

Pollard, or short bran, mixed with grains, or made into paste with water, is an excellent food, and should be given them three times a day. If they are made to feed on bran alone, it should be long bran. But the young ones will require less meat, if you have a convenient place for them to run in cover and out at pleasure. They delight in browsing on peas straw, or green furze. Some have thought that French wheat would fat them,

Good oats, barley, pollard, and fresh hearty grains, greens and hay, are the several kinds of food proper for giving their flesh a wholesome, sweet and good flavor. Sweet air, clean hutches, and their dung being removed to a distance, contribute to the same end.

They are subject to tunning, or to become pot-bellied; you may then recover them with mixing ground malt with their food, or with barley just broke. To preserve from tunning; observe, when they are fed with raw grains, always to give them hay in the same part of the hutch, to dry up the moisture of the grains; and on the other hand, when they are fed with bran, or other dry meat, greens must be given to answer their drowth.

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To kill them, you may either slit the palate of their mouths with a pen knife; or give them a blow behind the ears, then run a pen knife into the throat, continuing the wound for some length towards the jaws. These methods are given in preference to the old custom, which is attended with an offensive lodgment of blood in the neck, and the flesh is not otherwise so white.

The castrating the male rabbits, renders their flesh equally agreeable with that of the females, and more tender; they also thereby become as large as hares.

C H A P. XIII.

Of the MANAGEMENT and CONDUCT of BEES.

THE bee is remarkable in its industry and skill in gathering honey and wax from flowers, &c. and where good care and circumspection are not withheld in conducting them, their keeping will be profitable.

Let them have stands provided for their hives in a place near and convenient for attending on them; which would be better in a garden or shrubbery, for their resting when they swarm. These stands, which must be of wood, are to be no bigger on the top than will just extend to the edges of the hives, except in front, where a lodgment of a few inches must be left for the bees to rest on before they go in. Place these stands in strait rows, at twelve or sixteen inches distance, looking mostly to the south, and aslope, to throw off the rain; and the hives must be screened and defended from high winds, cattle, and fowls, yet so as to admit the warm influences of the sun.

The hives made of straw, of a nearly circular figure, are most in use; and in dressing these after making, the jutting straws, twigs, &c. are to be cleared, and the insides of them made as regular and smooth as possible.

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The hives should be of several sizes, to suit the different swarms; also, big hives are used when much honey is wanted, and lesser ones when the stock of bees is to be increased.

Each hive is to have three or four splints, according to its size; the upper ends of these are to be fastened at the top of the hive, and the lower about a hand's breadth from the skirt. Besides these splints, four others are to be driven into the skirts, by way of strengtheners; two of them to form door posts, and the other two hind posts.

Cow dung and sand mixed, with lime or ashes, are well calculated to keep the hives close so as to defend the bees from cold. A wicket is to be provided in winter at the door of the hive, with small convenient notches just to admit the bees, that no vermin may enter and destroy them.

Just before the bees begin to swarm, rub all the hives with savory, marjoram, thyme, hyssop, and other sweet herbs; and when the swarm is lodged, take a branch of the tree on which they settle, and wipe the hive clean with it; then rub the inside of the hive with honey and milk, salt and water, small beer, mead, or honey alone.

Early springs will require attention to bees by the middle of May; wherein particular regard is to be paid to the signs of swarming, and especially to watch those which seem likely to swarm first. Cold, dry, windy springs have but few swarms, and those late.

Mild, calm, or showery weather is good for the swarming of bees; and they are fond of rising to swarm during a hot gleam after a shower. They also usually rise presently after they assemble on the hive, or stool, if they hang in a cluster, and the weather do not change. But they will not swarm after accustoming themselves to lie abroad under the stool or behind the hive; this is sometimes occasioned by stormy or windy weather.

To make bees swarm, which are brought to it with greater difficulty the longer they have lain abroad, keep the hives very cool, by watering and shading them and the place on which they stand; then enlarge the door

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to give air, and move the cluster gently with a brush, and thus drive them in. If they lie out notwithstanding this, on the next warm day at noon, while the sun shines clear, put in the greater part with your brush, and sweep the rest away gently from the stool; and permit them not to cluster again. The bees thus dispersed will often hum in the heat of the sun, which will entice the others out, and they will consequently swarm. Or, if a pewter dish be placed under the clusters of bees, as they hang out in the heat of the sun, it sometimes causes them to swarm; by the heat being strongly reflected on them: But if this should be tried in vain, and they still lie abroad and will not swarm, raise the hive sufficiently to let them in, and then close up all the parts round it except the door.

In about ten or twelve days after the first swarm is gone, another brood will be ready, and over-fill the hive. They then, in the morning before swarming, come down near the stool and call each other; and at the time of swarming they go down to the stool, and answer each other, on which those within come forth. The chief swarm being broken, the second casts and swarms the sooner; then a third; and sometimes a fourth swarm arises: but in a fortnight or three weeks they have generally done swarming.

In swarming, when the bees have fixed on a place to rest, and are settled together in a cluster, hive them; but take care that the cluster be but a short time at its largest size before they are hived. Let the hive be of such a size, that the swarming fill it that year; and rub the hive with sweet herbs as before directed.

The person who hives them should wash his hands and face with beer, or be some way protected. When bees hang upon a bough, shake them into the hive, and set it on a cloth on the ground; or if the bough be small, you may cut it off, and lay it on the cloth, and place the hive over it. When they light near the ground, lay the cloth beneath, and when you have dislodged them, place the hive over them. If any cluster with-

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out the hive, sweep them gently with the brush towards it; and if they affect any place besides the hive, wipe them off, and rub the place with May weeds, wormwood, or nettles.

If the swarms, in separating, light in sight of each other, disturb the lesser part only, and the greater will fly after it; but if they light not in sight, hive the companies in separate hives, and bring them together, shaking one company out upon the cloth whereon the other hive stands, and place the full hive on them, and they will soon unite.

If you have a late swarming (that is, after the middle of June), and but few in number, put two or three swarms together, whether they rise the same day or otherwise; and by thus uniting them, they labor carefully, and raise much honey. The above union is thus effected: When it grows dusk in the evening, having spread a cloth upon the ground near the stands of these swarms, set a pair of rests or supporters for the hive, and knock down the hive out of which you propose to remove your bees, upon the rests; then lift the hive a little; and taking it between your hands to get out the bees, set the stock to the swarm to which you would add them, on the supporters over them, and the bees will soon rise into the hive, and be followed by those that remained behind.

To prevent being stung in the management of this business, provide a net so fine that a bee cannot get through the meshes of it. This net ought to be knit with fine thread or silk, and large enough to cover the head and collar or bosom of a man or woman. When stung, the most immediate remedy is to hold the part as near the fire as it can be borne; and then to anoint it with mithridate, or honey.

In fine weather, bees begin to gather wax and build combs, as soon as they enter the hive; and they complete some combs in a few days. Such is the natural industry of bees, that in thronging to the work, but few of them can perform any of it, till the combs are of a

considerable length; and then, while some finish the remainder of the cells, the rest fill those which are completed.

Bees decrease in their number towards autumn, and become still fewer in winter, as may be discerned in the difference of their numbers when they swarm, and those killed when you take them; for the bees of the last year now perish and waste, by degrees, with extraordinary labor, and their wings decay and fail them; whence it is plain, that a little more than a year is the usual age of a bee; and the young only of the last spring survive, and preserve their species till the following season.

The old stocks of bees ought to be removed by Michaelmas; or if it be then omitted, you must move them about the beginning of March, before they go much abroad, lest their swarming be prevented by it. The method of doing this, is as follows, viz. Take a board about the breadth of the bottom of the hive you intend to remove, and lift it up, and brush the bees that are on the stool forward; but let the board be a little supported by ledges, to prevent the death of bees on the stool. On this board you are to set the stock, where they may stand till you remove them. When you are about to move them, stop up the door of the hive, and set the board on which the hive stands on a hand barrow, and convey them where they are to remain.

The feeding of bees is attended with trivial advantage; because those that have not a profitable stock of honey to serve them the winter through, are not fit to keep; neither may they expect to reap great gain from them, who keep bees, and do not take care to keep them from spending that stock they have in winter time.

In spring, indeed, some stocks of bees are well worth preservation; for instance, such as are numerous, though their honey is small in quantity, which may be owing to a dry and cold season; and these frequently prove a good stock.

To supply bees with food, convey small canes into their hives. This must be begun in March, because at that

that time they most need it; and the canes must be given them till the season advances wherein they collect sufficient subsistence, without requiring to be served with any.

Honey is the most natural, and therefore the best kind of food for bees; but it may be mixed with good sweet wort, to make it go farther. A piece of bread that has been soaked in ale is sometimes put into the hive, and the bees will eat it with great avidity. Bean flour, roasted apples, and bay salt, are severally given them by different keepers; and they are very fond of the last, as well as salt of any kind, which is good for them. Bees kept near the sea side thrive well; and every stock of bees should have water mixed with salt near their hives.

To improve the number of bees, take half a dram of musk dissolved in rosemary, one dram of camphire, a handful of balm, and yellow bees wax and oil of roses, of each equal quantities. Melt the wax with the oil of roses, and pound the balm and camphire well together; then make the whole into a mass, and when it is cool, put in the musk, as great heat dissipates much of its scent. A quantity the size of a hazel nut of the above mass, is to be laid within the bee hive; and the number of bees will not only be thereby increased, but the profit of this honey and wax will three times exceed the profit on those raised without the above expedient.

Bees are often troubled with lice, which may be destroyed by strewing tobacco over them. They are also subject to a kind of purging in the spring, which is often very fatal; this some suppose an annual distemper, occasioned by spurge blossoms and elm seeds, and recommend rosemary and honey diluted with water, for it. Others think it happens by the bees feeding on pure honey, and advise to feed them with a honey comb taken out of another hive, the cells of which are filled with crude wax, or bee bread.

The following is a description of such stocks as are proper for keeping, and others that are to have their

combs taken by killing the bees, viz. Those swarms which are best to keep, are of one or two years standing; likewise those of three or four, which by reason of their swarming the last summer are full of bees, and those most probably the best: But such of that age as have cast hives, are not likely to continue, and therefore are to be taken; as are also poor swarms, which are not worth the feeding; light flocks; and those that do not carry out their dross, or drive away the drones when the hives are full; those whom robbers easily assault, are to be suspected; those with broken combs; stalls of three years old and upwards, that have missed swarming two years together, especially such as have lain out the summer before, and that did not swarm the last season, they being seldom prosperous, are particularly to be taken while they are good, as with waiting for their increasing, they may be kept till they perish. Such as have missed swarming two years together are seldom good, except a few particular sorts, which always maintain themselves, and may be kept nine or ten years.

By the above remarks you may distinguish between such as are to be kept and those that are to be taken; and the method of taking and killing is as follows, viz. Towards the latter end of August, when you have fixed on those stalls which you intend to take, in the evening, at about four or five o'clock, dig a hole in the ground nine inches deep, about the size of the bottom of the hive, and put the loose earth round the edges of the hole; then provide a small stick slit at one end, and put in it a brimstone match (or two, if one is not sufficient for the size of the hive), as thick as your little finger, six inches in length; place the stick with the match in the middle or side of the hole, so that the match may be nearly on a level with the edge of it; then set fire to the match or matches, and place the hive instantly over the hole; after which, close up the crevices at the bottom with fine earth, so that no smoke may come out, and the bees will soon drop, and die.

When you have thus unboxed your hive, place it carefully on the ground on the sides of the combs; then

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loosen the ends of the splints with your fingers, and separate the edges of the combs with a wooden slice; after which, take out the combs one after another, and having wiped off the half-dead bees with a good feather, break the combs into pieces while they continue warm.

That which runs of itself from these broken combs, is called virgin honey; as likewise is the honey which runs from the first year's swarm. This is esteemed the best, because of its fine taste and crystal-like clarity; it is therefore preferred to that which is squeezed out of the combs for special purposes, such as for making mead, which is required to be of a fine flavour, &c.

As soon as the honey leaves running, put up what you have warm in pots by itself; and it will, for two or three days after, work up a scum of coarse wax, dross, &c. which must be taken off. The remaining honey, that is, the coarser sort, must be pressed from the combs; and this is also to be put in pots, except any be required for immediate use.

When the combs have been pressed, put what remains of them into a hair bag, and wash it well in water; and when the sweetness is all out, dry the balls for wax. They are to be thus ordered: Take the wax and dross, and set it over the fire, pouring in so much water as will make the wax swim; then keep it gently boiling, stirring it all the time, which, with the water, will keep it from burning; when thoroughly melted, take it off the fire, and strain it through a fine linen, or twisted-hair cloth, placed ready on a screw, or press; then lay on the cover, and press out the liquor (as long as any wax comes) into a kettle of cold water; but first wet both the bag and the press, to keep the wax from sticking: The greatest quantity of water will come first; then most wax; and at last will come more dross than any thing.

The wax is to be made into balls as it hardens, and the water is to be squeezed from them; when this has been done, the balls must be broke into crumbs, and put in a pot over a slow fire. As the wax melts, stir and skim it with a spoon dipped first in cold water; when it

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is cleaned of the skum, and perfectly melted, pour it into a pan or mould, whose bottom and sides have been rubbed with honey; and take care not to pour the dross in with the wax.

If any froth remain on the top of the pan, blow it to one side, and skim it off carefully with a wet spoon; and put the pan at a moderate distance from the fire that it may cool by slow degrees. Keep the large cakes warmer, lest their tops cool too fast for their centre; the several parts should cool as equally as possible. When a cake is found to stick, warm the sides of the pan, and it will presently come out.

Good wax is of a yellow color; light, firm, pure, and of a sweet smell: With these properties, English wax sells for five pound a hundred weight more than the foreign

In medicinal uses, bees wax is deemed a medium between hot and cold, and between dry and moist; and becomes the ground of salves and plasters. It appeases and mollifies sinews when strained, and is used in resolving and ripening ulcers. If milk be curdled in the breast, the quantity of a common-size pea will dissolve and attenuate it.

Wounds of great depth are cured with the use of oil of bees wax, in ten or twelve days; lesser wounds are cured in two, three, or four days time, if only anointed with it. It is also inwardly applied; a dram at a time in white wine, provokes urine, removes stitches and pains in the loins, the cold gout, and other complaints that originate from cold, which is the source of numerous disorders.

Honey has also many beneficial uses; its particles are subtile and piercing as those of oil, and easily penetrate the parts of the body. It is of an opening and cleansing power, and discharges the breast of humors and obstructions that fall from the head; also the foulness of the body is removed, urine is excited, and the blood is nourished and rendered good by it.

Honey is in a less digestible state while raw, and it could be clarified for internal use.

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SKETCH OF CONSIDERATIONS ON TAKING AND IMPROVING A FARM.

TO succeed in taking a farm, the nicest estimate should be formed of the sum necessary for the completion of the business of it; and an entrance made only in case of competency. In the next place, it is essential to have an understanding and acquaintance in every branch of the management of it; or to employ a bailiff, upon whom this charge may with safety be devolved.

The land accounted to pay careful husbandry the best, is, the black, rich, crumbly, dry, sound, deep-stapled loam; and this testimony has the support of very considerable experience in agriculture. However, for forming a judgment of this article, a more explicate description of the division of soils, as they are classed into Chiltern and Vale countries, may illustrate the foregoing, and not be amiss—but so much by the way, for I shall presently give a particular account of the distinctions and properties of different soils.—Under the former of these are included clays, loams, sands, chalks, stoney and gravelly grounds, &c. which are mostly inclosed, and require much ploughing, with costly dressings of chalk, foot, rabbit-skin clippings, horn shavings, rags, hoofs, hair and ashes, besides dunging; and such part of

of it as is under the plough, is usually rented at more than double the sum of the vale country per acre. To answer the above difference, raising a great proportion of cheap root crops for home feeding, cultivation of foreign grasses, and rejection of too much fallowing, cannot be too attentively considered and practised by the chiltern farmer.

The vale country consists in black loams, or dark blue marley clays, in open fields, that are commonly under one and the same management, and are brought into tilth and condition for corn with less trouble and expence than the chiltern. This requires but little ploughing, the earth being easily shattered and pulverized; and is chiefly satisfied with the fold, and the dung of the cattle and fowl upon these farms.

BUT a farmer may happen on a disadvantageous, poor soil; in this case, the common means of correction and retrieval, are manuring, cleansing, and changing the crops. The cheapest, quickest, and most approved methods pointed out for exciting the fertility of such land, are breeding and feeding large stocks of cattle, and use of young ling, fern, &c. (where these can be had more easily than stubble) by way of litter, for the purpose of increasing manure. Or,

If wet lands be the subject of complaint; these must have good and sufficient draining, before they can be ploughed to considerable purpose. To answer this intention, the covered drain is generally held the best; because it is not so liable to closing up; as also, for saving the land, and continuing a number of years without need of reparation: This drain is described in page 16 preceding, where its particular application is more largely expressed. But, besides draining, it may sometimes, where no ferruginous quality in the earth is discoverable, be proper to pare and burn a soil; when the operation of this beneficial and happy expedient, forms a wet or hilly surface, into a rich, fertilizing manure; nor will the ground contract prejudice from

from the repetition of it, at any period, when apparently requisite.

Thus, by diligent application to modern improvements in agriculture, complaints against variety of lands may be much lightened, if not totally removed; and, by discarding a very reprehensible attachment to customs of time and place, cold and barren lands might often be brought to yield their fruits with increasing vigor and abundance.

WITH respect to his *Arable Land*, a farmer must increase his crops of roots, &c. and cultivate corn only in a mean proportion to these. For instance, of a given quantity of land in tillage, three fifths may be laid for artificial grasses, pulse, and roots, which meliorate, cleanse, and enrich a soil; and the rest for the growth of corn. This division will supply food for cattle, which is an interesting consideration; and by feeding of cattle, and rendering the land into good heart and condition by manure from them, probably the most beneficial crops of all kinds are secured; whereas, these being rejected for views of raising more corn, brings on a necessity of purchasing manure at any price, exposes to a variety of misfortunes attending precarious husbandry and bad seasons, and leads to much more loss than profit.

IN the disposition and conduct of *Grass Farms*, it is to be noted, that an acre and a half, two and a half, or sometimes three acres, according to the richness of the pasture, is an allowance for a dairy or suckling cow through the year; but in general, cows may be maintained with an acre for the summer food; and the hay and after feed of an acre and a half, for winter, each.

Beasts are more profitable than sheep for fattening on farms that consist all of grass. They are best bought when full forty stone, and should particularly in spring be plentifully fed with the very best sort of hay. Beasts

of all kind, and sheep, are cheapest in autumn, and therefore should be procured in that season for fattening.

Grass farms, which are wholly mown for hay, return best with a city or capital town near them.

Grass lands should be kept clear of thorns, briars, thistles, docks, &c. and likewise mole and ant hills.

Sometimes improvement of soil is obtained from watering meadows, when it is used as a substitute for manure. Where this can be conveniently given, the proper time is six weeks before mowing; besides which, another is recommended for a second crop: but for this, the purest water is to be had; and care is to be used to make the distribution over the land as equally as possible, and not to suffer the water to remain there more than forty-eight hours, lest chilling or putrefaction be the consequence.

IT is also very proper due regard be had in the article of *Labor*, to proportion the number of hands retained, to the business to be done, so that diligence and profit may always accrue on the oversight of them.

The draught cattle at all times command the particular care of their drivers; and it were best to have one man attend sheep; another, hogs; another, the cattle fattening; &c. in which distribution, business is better understood, and more satisfactorily completed.

OF DIFFERENT SOILS, AND THE CULTURE PROPER FOR THEM.

C L A Y S.

1. *Black* and *dark Blue* are the primordial degrees of clays; they contain black mould, and the greater the proportion of it, the richer the soil. This earth is of a marley nature, whose particles are easily separated, and requires as little dressing as any. The largest, best, and finest crops of red lammas wheat are raised on it; it favors beans, turnips, and grasses, in their growth;

growth; and beef and mutton of the choicest qualities are furnished where this kind of soil is found.

This earth, being of a brittle texture, yields easily to the operation of the plough, on which account few ploughings render it fine enough for sowing. It is at present laid often into stiches for wheat, but nothing else; and when sown thus, in preference to broad lands, the water is sooner dissipated.

Black clays must be cautiously ploughed; too few, or too many ploughings, are alike detrimental. The foot plough is most applicable, as they chiefly lie in vales; and the manner, is, only one way in broad lands, on half-acre pieces, laying it as high as possible, to avoid the pernicious consequences of too much wet. The plough is drawn directly up and down, by dividing the half acre, and turning the land two contrary ways, thus leaving a thorough in the middle.

Bluish clays, or stiff black loams, that are laid in ridge half-acre and whole acre lands, and never ploughed across, but kept up to their stunted breadth, length, and height, according as they lie wetter or drier, are found to affect wheat and horse beans; to these tilth crops of barley have been sown in succession, and found to answer. But peas are seldom or never sown on them, because the richness of the earth would occasion their running into too much straw.

2. *Red Clay*, differs from the hungry ravenous nature of gravels, sands, &c. and requires more ploughing than dressing. It agrees with almost all kinds of dressing; but the most suitable are those which are dry, viz. lime, chalk, foot, and ashes.

This earth is of an adhesive disposition, and rendered most difficult of fine tilth by the extremes of wet and drought. Wet heightens its tenacity, whereby it permits the passing of the coulter without breaking or dividing properly, so that several ploughings and cross ploughings hardly effect a pulverization; and droughts harden it in such wise, that it gathers into clotty heaps before the plough, and seems proof against dissolution

into a small body by the cut or break of the coulter and share. Good chalk, if timely drawn, and a sufficient quantity be laid on, and well harrowed in, with a mixture of sand, will convert the stiffness and sourness occasioned by the former; and the latter is corrected by taking advantage of the rains which slacken the ground, when it will be fit for reduction by the tynes of the harrow, which should be well used on it both ways, without loss of time. Clays, it is to be noted, cannot be ploughed too often, nor gravels, chalks, and sands, too seldom; and the sourness of the tilth of the first, happens chiefly by want of timely ploughings and harrowings.

To get a wheat-stubble ground of this clay in tilth for peas or beans against the next spring, the stiches ought to be ploughed into bouts by the beginning of November, and left the winter afterward; and before it be sown, harrow it, and sow the peas or beans in four thoroughs, in the same stich, and in the method it first lay; then, after they are sown, harrow it again.

3. *Yellow Clay* is a richer and more loamy soil than the red; and therefore trees, grain, and grass, thrive and grow faster in it; but the same culture and management are used to both.

4. *White, or Tobacco-Pipe Clay*, is less tough, cold and moist than red clay; and with its looser, warmer, and drier parts, is rendered a more beneficial earth.

This land will be brought into condition for sowing of grain with little ploughing, and when fully encouraged by good tilths and dressings, will yield vast crops of wheat: barley and peas also thrive on it, especially in wet summers; but beans do not answer so well; these require a double dressing of fold and cart dung.

But this earth, on the other hand, has its disadvantages; and when laid in stiches or ridges, is soon crumbled and dispersed from about the roots of plants, by frosts, rains, and winds, which ruins that part of the crop that has been left bare: The usual, and only prevention, in this case, is the fold.

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To prevent the poppy, which infests it, and other incommodities, it is best sown with wheat before Michaelmas; and to run the fold over afterward, to settle the earth about its roots, that the weather may not spoil the crops. The roots after this, may be more closely secured from the sun, rain, wind, and frost, with the use of the roller, by drawing it along the stiches.

Clover grows in this clay, though not so well as in the red, yellow, and black clays; and therefore it is preferred for trefoil and saintfoin. Elms, thorns, and other hedge wood, will also grow in this soil.

Thick early sowings in this sort of ground are necessary, and sowing in wettish weather most proper.

G R A V E L S.

1. *Loamy Gravels* are such a soil as consists of earth and a slight mixture of small stones, which constitute an aptness to fertility, as the juices of dung, &c. ascend easily in them for the nourishment and promotion of the growth of trees, corn, or grass.

This soil is proper for all sorts of grain, which, accuracy and diligence of management supposed, it returns with great abundance. The dressing must be good and sufficient quantities of mould and dung, as the rains, &c. wash much of it away, through the openings occasioned by the irregularity of the sides of the stones; on a failure of this, the soil preys on its own mould substance, and will descend to leanness, and a barren state.

These gravels are disposed to binding, and to form a hard and crusty surface, by great and continued rains, particularly if following soon after ploughing and sowing, so that wheat, peas, or barley, are bound in on all sides, and sometimes destroyed, being unable to find room for the progress of their maturation. But this may be prevented with a manuring of chalk; which renders the

the soil more loamy, opposes the binding quality of it; and renders its condition more sweet and pure. Harrowing may, at times, be given besides.

This sort of soils is accounted light and sweet; and being of an opposite nature to clay, is worn out with too much ploughing. The ploughings for grain that are sown on it on broad lands, are to be shallow, otherwise the plants will be hindered in getting through the surface of the ground.

Lands approaching to the nature of loamy gravels; or that have a gravelly pebbly bottom, that are singularly light and hollow, and have been too long sown with corn successively, are frequently overrun with weeds and other impediments to a good crop. The means of remedy for these evils, are to give the land a due course of fallowing, or other equivalent substitute, so that it be made thoroughly sweet—let it have every wheat year, or barley season, a dressing of manure accordingly; and in the wheat year, the fold, which is a great friend to this sort of ground, as by treading they bring it into a closer union of its parts, and thereby defend the wheat with nourishment, destroy the weeds, and kill the worms, which most of all inhabit in light ground.

Manuring with horse, cow, or swine's dung, increases the lightness and incoherence of a soil; and if land of this kind have been dressed with these upon a good tillage, the wheat will be easily forced down with winds and rain; but the use of the fold will also prevent this, by its pressure, which combines the earth, and enables it to hold the roots of the wheat fast.

This loose earth and dry bottom is best ploughed and sown in a wettish time, which contributes to bind, and to keep it in that salutary state during the next winter and summer that the wheat is to grow in it. But the rains which generally fall in barley, and other seasons at the spring of the year, helping to fasten this ground, it should be ploughed and sown earlier than clays, that it may be ready for the benefit; and further, the lent grain has only about half the time of the wheat to be

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in this earth, so that the weeds have not now such an opportunity to run into rankness, as is afforded in the long wheat season.

After all, such land were best laid down with artificial grass, in order to obtain a natural sward, into which it will run very cordially, and much quicker if excited by sowing the seeds of fine upland meadow hay amongst the clover, trefoil, or ray grass.

2. *Sharp Gravels*, are earth containing small sharp stones, mixed with some mould; and the greater the portion of the latter, the more the value of the land increases.

This soil is also apt to bind; and requires the same management as loamy gravels.

Dressing is absolutely lost on this land, where the quantity of the stones abounds; because the water, running swiftly through the interstices occasioned by them, washes it away below the roots of whatever is sown, and they being deprived of the nourishment of the dung, &c. become hungry, pine, and often perish.

There is also a kind of gravel, impregnated with globular blue pebbles, whose nature is too voracious of dung and other dressing, to require ploughing and sowing; this is therefore, in general, left to the production of spontaneous grass: However, French wheat has been recommended as a corrective dressing for such, and experiment of it may be an object with some possessors.

3. *Clay Gravels*, or *Clay Loamy Gravels*, bear a near resemblance and analogy to gravelly loams; but wherever the red clay appears as part of the soil, there will be occasion for more ploughings and warmer dressings than in any other sort of gravel. Clay gravels are very adhesive, and must have good stirring with the plough.

4. *Sandy Gravels* are of a loose nature, and easily ordered: if duly assisted with manure, they bear very good and early crops of corn; and will grow peas and turnips in the same year.

These, particularly, may have the long horse litter laid

laid on them, and ploughed in, as its tough and spongy nature is suitable to them. Or, the horse litter may be laid on the top of the stiches on broad lands, as soon as wheat is sown; if some be ploughed in thus, and a layer on the top afterward, it will preserve the ground from shoaling in the frosty seasons.

5. *Ragstone Gravel*, is a thin short chalky surface, which commonly lies on a whitish, hard stratum, between a chalk and a stone, called hurlock, or ragstone, whence it has its name. It is of an exceeding hungry nature, owing to the hollowness in its component parts; and so poor in many places, that with a fallowing of two years, it affords but a miserable pittance of natural grass.

C H A L K.

Chalk, the dry, lean sort especially, being of a short, crumbling nature, is easily got into tilth, weeds growing less on this ground than on any other; and two ploughings will do as much service here, as four in red clays. It is usual to hear, that a fallow and a half is enough for a chalk; nor is there conveniency indeed for bouting and four thoroughs, &c. as in some lands; wherefore, it is often turned each time of ploughing the reverse cross way of the last operation; and by some laid into broad lands, but mostly into stiches for wheat. Wettish weather alone is the fit time for sowing grain in chalks, as in that season they become clotty and rough, which remarkably hinders the growth of the poppy, the only weed to which this ground is subject; wettish weather likewise binds and keeps them from suffering by frosts and cold. The tillage given this ground must not render its pulverization very fine, as thus the wheat and other grain will likely fall before the winds, and be much hurt. On the *marley clay sort of chalks*, ploughing to a greater depth is admitted, and more of it; and on *loamy chalks*, a still freer use of the plough.

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But whether this soil is ploughed into broad lands or fitches, rolling is very necessary, especially in the last, where the roller is drawn both the long and cross ways, in order to fasten and keep the ground firm and close to the roots of the grain; also, to preserve them from the violent heats and droughts in summer, of which broad lands are more capable, than fitches.

The worst of chalks are the *burlock* or *stone*; though these, with thorough dressing, will bear good wheat, rye, barley, peas, vetches, and lentils; but where this dressing is wanting, they commonly sow for lent grain. Lentils and vetches will grow and flourish in the poorest chalks; and are frequently sown on these amongst oats, being far surer in their returns than peas.

M A N U R E S.

1. *Marle* is the best and most durable of all manures; and at the same time that it fertilizes and improves better than any, it is comparatively unexpensive. A gravelly sandy ground is particularly capable of great fertility by a manuring of marle. This may be had for the acre from fifty shillings to four pounds; and will continue its advantages twenty years. Marle, that has been spread on land during a summer and winter to dissolve, is to be ploughed in between Michaelmas and Candlemas.

2. *Chalk*, the fat, soft sopey kind, is the greatest alterative to clays, loams, and gravels; it cures the former of their sour, austere, cold, hard and tough qualities, and establishes a lightness, warmth, sweetness, and shortness in their stead, of some times twelve or twenty years continuance. Loams and gravels have their sour and binding qualities corrected by the use of this mineral; and the plough afterward performs its operations with facility, the ground also becoming more fertile. Twenty-five or thirty loads will be enough to chalk an acre of ground well, which, with discrete ploughing,

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ploughing, will last twenty years. Chalking is to be performed about Michaelmas, or within a month after, that the frosts may shatter and crumble it during winter, while lying on the surface of the earth; and when it has been reduced by the weather pretty well, it may be ploughed very thin into the ground, at Candlemas, with or without a fin on the share. Thus exhibited, chalk is an admirable dressing.

3. *Lime* is exceedingly beneficial on black moory peat earths, and boggy lands; its nature is calculated to assist these soils in exerting the vegetative virtue they naturally possess. Twenty, thirty, or forty bushels of lime may be spread on an acre, and when slaked, ploughed in. Wheat is assisted with a dressing of it; for which it is to be slaked, and sown hot on the land immediately upon the last ploughing; but the wheat is not to be sown till six or ten days afterward. If turnip seed be to be sown when and where lime is slaked, they may both be harrowed in together. This manuring, though common, is never of long continuance; and the price of it varies, under a multitude of circumstances, from ten shillings to ten pounds.

4. *Clay*, burnt to ashes, is proper to be sown over turnip ground, to prevent the fly and slug; which also nourishes this crop. It is important, in the last-mentioned instance, if sown or strewed by the hand, out of a feed cot, in spring time, over wheat, oats, barley, peas, and beans. The quantity of three cart loads may be thus used on an acre; which will be productive of many very good effects. Clay ashes are to be used on meadow ground only in January; it will here eat off moss, which impoverishes grass of its due portion of nourishment. Clay is of some considerable duration, in which respect, it is said to be nearly equal to marle; and if good of its kind, the former is preferable to an application of an inferior sort of the latter. The expense is the same of either.

5. *Peat Ashes*, to the amount of six or ten bushels (at about eight or twelve pence each) may be sown
early

early on an acre of wheat, peas, turnips, clover, rape seed, or saintfoin; a greater quantity will do hurt; and caution is requisite, not to use them over barley, for should a dry season follow, it will be burnt up; but where showers fall timely after sowing them, their beneficial effects will soon appear. This manure helps to keep off the slug from peas and other grains, which it also befriends in cold wet seasons.

6. *Coal Ashes* are an improvement to meadow ground, crops of wheat, barley, artificial grass, &c. Forty bushels (at about four pence each) are used on an acre; with which meadow land will produce good and early crops of the best grass, for three or four years together: and a like quantity may be used on each acre of clover, ray grass, trefoil, lucern, or saintfoin, in the beginning of March; as being sown then, their virtues are often more advantageously carried into the soil, which fertilize it for the production of these grasses. Application of them is sometimes made in compost dung, highway, or pond mud, with chalk, lime, or sope ashes, for meadow ground; but they are used alone on wheat lands in February and March, where they succeed well when followed by a wet summer. On clay land, that has been fallowed in broad lands, sixty or a hundred bushels of coal ashes may be laid in heaps on an acre, and spread thin with a shovel or spade in a dewy morning, to prevent their dispersion; they are afterward to be ploughed, as shallowly as possible, with the ground into broad lands again, across the preceding way, or into four-thoroughed stiches, or by hacking; with which, the ground will be reduced to a loam.

7. *Wood Ashes*, though not half so durable as coal ashes, are nevertheless of great service both to natural and artificial grasses. The time of laying them on is at Lady day, and a hundred and sixty bushels (at three half pence each) are not more than enough for a dressing for one acre of grass ground; though twenty, thirty, or forty bushels, on an acre of wheat, rye or barley ground, given in February or March, will be sufficient.

cient. They increase fertility, either used with short horse dung, dung of cows, fowls, &c. and stover, or alone.

8. *Buck Wheat*, as a manure in clays or cloddy grounds, hollows and lightens them; and in dry, binding gravels, it is loosening, and conveys moisture. Heavy sands, sandy loams, gravels, and like light grounds, profit much by being dressed with it; and it were properly ploughed in for seed only on these soils. It is a cheap dressing and a great destroyer of weeds; and the expence of an acre is only about half a crown.

9. *Soot*, used on wheat lands, requires to be sown the beginning of March; to this purpose, twenty or twenty-five bushels of coal soot must be had for each acre, which is to be strewed as thin as possible out of a man's hand, over wheat sown on broad lands; and the virtue of this is retained three years. The chief use of this manure is on wheat, rye, and barley; and the period of sowing, includes Christmas and April. It answers only on barley that is sown on broad lands; and is best harrowed in with barley seeds; in which way, it prepares for, and almost insures a good crop of peas the next season, if sown on the same ground. Soot, on new sown turnips, greatly forwards their growth, and destroys and keeps insects from them. If soot, or even coal ashes, be sown over a second year's crop of clover, it will likely bring on a full bite in April; and sometimes it occasions double the quantity of grass that would rise without this manure, or a dunging of some kind. The benefits of soot, on a meadow ground, are many; it preserves grass in a growing condition, against frosts and chills; kills worms, grubs, dars, and slugs, or prevents their doing hurt to the grass; burns up and destroys moss, the common and greatest enemy to meadows; brings on a speedy head of grass; and, when a wet warm season follows it, there will be a vast burthen of the best grass. Twenty bushels of soot, sown at Candlemas, on an acre of saintfoin, or any artificial grass, once in three years, exceeds every other dressing, and is of essential service to them. The value of coal soot,

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at twenty or thirty miles distance from London, or other large cities, is about a shilling a bushel.

10. *Malt Dust* is a dressing for barley particularly; the quantity is ten sacks to an acre, which is sown directly after the seed, and harrowed in with it.

11. *Common Salt* is good on crops of grass and corn; and six bushels of it may be used to an acre. It preserves the plants from chilling in frosts, wets, and winds, better than ashes, lime, or foot.

12. The use of *Oil Cake* is followed with a good degree of fertility for two or three years, and is proper as a dressing for wheat barley, and other vegetables. Plough it in with wheat seed (allowing a thousand, ground, to four acres); or sow it on the top of this crop; also, on crops of barley, peas, clover, rapes, &c.

13. *Horn Shavings* are a tough, hot, and oily manure, and suited in its nature, not only to dry, husky lands, especially sharp gravels, but to cold, wet, clayey earths. Pea crops are greatly increased in profit with this application; which is to be sown and harrowed in with the seed for them: wheat, rye, and barley grounds, are dressed with it just before the last ploughing. The quantity is twenty-four bushels to an acre.

14. *Woollen Rags*, chopped small, are used as the best dressing for barley and wheat in some chalky, gravelly, sand loams, and dry lands in general. Eight sacks, of fifty-six pounds each, will serve an acre. These crops, growing on the above soils, are greatly aided in their progress with this manure; which is to be sown with the seed, ploughed shallowly into the earth as soon as sown, and then harrowed. The virtues of it last two or three years.

15. *Crag* is a reddish shelly earth, and one dressing of it (twenty-five cart loads to an acre) will derive virtue to a soil for seven or twelve years afterward. Hungry sandy grounds are enabled to produce very good crops of grain with a manuring of it.

16. *Sea Weed*, rotted alone, or mixed with sand, mould, or lime, is a good dressing for arable lands of all

all forts. It is to be sown and ploughed into the soil in July, or later, for a wheat or barley crop.

17. Twenty bushels of *Cow* or *Hog's Hair*, scattered over an acre of land, in light soils, and harrowed in with seed, are considered as an ample manuring for any crop that is to grow in it.

18. *Hoofs of Oxen* or *Cows*, if forced into the earth whole, with sticks, at about a foot distance from each other, presently after wheat or barley is sown, are a good dressing of six years continuance for chalks, gravels, and loams.

19. *Old Thatch* is serviceable on a natural grass land, and a good quantity of it may be sown as soon as a crop is mowed. This covering hollows the ground, gives the rains and dews freer access to the roots of the grass, and causes a great and improved increase.

20. *Pigeon's Dung* is a very choice manure for wet clays and moist heavy loams, where it forwards the growth of all grain, grass and trees; but this should be exposed for some time to the open air, out of the dove house, to take off its fiery heat. It is most efficaciously sown the latter end of February, or beginning of March, and ploughed and harrowed in with the seeds of grain, &c. About twenty bushels serve an acre. This dung must be mixed with some dry earth to break its parts, that it may be scattered more regularly; and it is in itself so very rich and hot, as to bear such an admixture without greatly impoverishing it. The dung of pigeons is esteemed by some better than any other for asparagus and strawberries; and for the propagation and culture of garden flowers. Some use it for those trees whose leaves turn yellow, on growing in a cold soil; to be fit for this purpose, it must have lain three years in a dunghill; it is then to be applied sparingly in autumn, laying about an inch thickness of it at the root, and suffering it to remain there till the March following.

21. The *Dung of Hens*, and all other fowl, particularly the *Goose*, are great improvers of meadow and corn land; they are hot and full of salts, have a natu-

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ral tendency to facilitate vegetation, and are quicker in their operation than the dung of animals which feed on the leaves of plants. Hen's dung is frequently mixed with chaff, malt dust, short horse dung, cow dung, &c. and may be used with these for a dressing on corn, grass, or wood land, at Christmas or Candlemas.

22. *Dung of Dogs* has the character of being preferable to any produced by other quadrupeds, and yielding fertility the next in degree to pigeon's dung; it answers exceedingly well over crops of wheat, barley, beans, and peas, on dry gravelly soils.

23. *Rabbit's Dung* is a valuable dressing, and may be harrowed in on arable and meadow lands at Christmas or Candlemas, with barley or grass seeds; it will also occasion a vast increase of turnips, if harrowed in with the seed. An acre will require thirty bushels, at sixpence each.

24. The *Dung and Stale of Sheep* are efficacious on all manner of loams, but more so on gravels, chalks, and sands; and enable them to yield a better nourishment to the corn. Worms, grubs, flies, and caterpillars, are prevented from breeding in grounds, by the use of this manure; and the dressing of sheep's dung, that succeeds a cart-dung dressing, affords a natural and refreshing assistance to land. By the running of this animal after sowing the seed, in dry weather, many crops of wheat, barley, turnips, grasses, &c. are greatly enriched and augmented; but this must not be a constant practice; nor is this manuring of above one year's continuance. Folding on meadow land, in November, when the weather is not too wet, is beneficial to a growth of grass, by killing what moss is on the ground, and preventing more from springing up.

25. The *Dung of Horses and Mules* produces a sensible heat, and from their use great effects are brought about, especially when newly made and a little moist. This is proper for the kitchen garden, where it invigorates and gives new life to every thing, supplying the

the place of the sun. Horse dung is also the richest of all improvements that can be had in any quantity for poor, cold and hungry lands; yet, when either too new, or when used alone, it is very prejudicial to some lands; and if spread too thin on dry lands in summer, it becomes of very little service, the sun soon exhaling all its riches, and leaving it little more than a heap of stubble, or dry thatch.

26. *Cow and Ox Dung* are fit for land that is hot, light, and dry; but being mixed with horse dung, become proper for most sorts of soil, and for some they are to be mixed with mud.

27. *Hog's Dung* is supposed by many the fattest and richest of all dungs; and is found better than any other for fruit trees, apples, pears, and the like. It is also a very rich dung for grass; and is said to do as much good in one load, as any other dung whatever in two.

28. *Deer's Dung* differs very little in its quality from the dung of sheep. These are esteemed particularly good for cold clays; and are recommended to be beat to powder, and strewed thin over the autumn and spring crops, about four or five loads to an acre, in the same manner as you would malt dust, ashes, &c.

29. *Human Dung* is also a great improver of all cold and sour lands, but succeeds best when mixed with other dungs to give it a fermentation. This dung is extremely beneficial in the growth of very large crops of wheat, as, when fermenting, it derives a most kind and genial warmth to the young plants of the corn in their weakest state, and in the severest seasons.

30. *Urine* is a good dressing for most vegetables; and as it is preserved from time to time, may be sprinkled from a watering pot over crops of wheat in the four or five first months of the year, especially on chalky loams, with advantage. It promotes the growth of kitchen garden productions, some of which are forwarded and improved with the use of it. But it must be used cautiously; and not on the roots of trees, except in January, February, or before May is over, lest the drying heat

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DUNG kept in the farm yard, should have a covering, or else be disposed in one great heap, for the preservation of its good properties from rains and droughts; the moisture running from it, must be retained by a trench, and now and then returned, to keep it in a humid state. If the heap do not require it all, cabbages, kitchen roots, wheat, peas, beans, or oats, in their infant growth, and also grass lands, being assisted thereby, may be watered with it; but on no account should it be left to run to waste.

The consequence of a great supply of dung, for raising every production of the earth, cannot be too warmly set forth; nor can the accumulation of it be too carefully, or even adequately made. With the use of dung, the decays of exhausted lands are repaired, the defects of indifferent soils removed, and vegetables encouraged in their growth, by being thereby enabled to receive easily, at the mouths of their roots, the juices of the surrounding terrestrial substances for their nourishment and increase.

O F C O M P O S T S.

COMPOSTS are of use in meliorating and improving of soils, and assisting the earth in the work of vegetation.

The scourings of ditches, ponds, or other mud, mixed with earth, dung, &c. being of a heavy nature, are a proper compost for light, loose land; and dung, sand, ashes, and natural mould, as a compost, being sprightly and active, insinuate themselves most easily for the dissolution and enriching of clayey, or cloddy land.

However, the shovellings of dirt, turf, or (if near the sea shore) ore weed, or sand of any kind, may be mixed together; and twice afterward turned and mixed

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again, allowing two or three months between each time, the better to distribute their diverse qualities through the whole. If a quantity of this be ready to lay on just before the last ploughing for wheat, it may be used on a generality of soils, as a very excellent dressing; the crop with it, will not only be large, but free and clear of smut: but other well-regulated management must go along with the use of this incomparable compost.

For the augmentation and improvement of the quantity and quality of manures, alternate layers of fold manures and of earth, clay, chalk, marle, or lime, may be formed into compost hills. And there is less fear of a want of earth to this purpose, if the hill be raised near the head lands of old ploughed grounds. The ploughings and harrowings of wet grounds yield a surplus of excellent earth, which is often so inconvenient to a farmer that he is obliged to cut deep grips through the hills of it to carry off the water; these being dug up and exposed to the winter's frosts, &c. and, in a fallow summer, mixed with manures on the head lands, is an eligible method of increasing manure.

OF PLOUGHING.

Ridging up, in vale ploughing, is done by beginning in the middle of a half land, or half acre, with the foot plough, which, the first time of fallowing, fills the great middle thorough that was left when the last grain was sowed thereon, by drawing the plough up and down each side of the middle of the land, till the half acre is all ploughed. This ploughing is used by vale farmers on all their grounds, till they sow their grain, and then they alter.

Casting down is performed the last time, when the seed is sown, by beginning at each out side of the half acre, and ploughing every thorough down, till you come to the middle, when a large thorough is to be left wide enough

enough for a single horse to go along without offending the corn, if it be not too high.

Ploughing or Fallowing up the bean stubble for wheat, is begun in April for the first time; and it is to be harrowed down once for all, before a second ploughing is given, which is at Midsummer. The middle of September is the time for the third and last ploughing, when the seed is also to be sown. Some give their wheat land a fallow in April, and two stirrings between this and sowing time; and this is found a beneficial practice. The fallow ploughing, and the two stirrings, consist in ridging up; but the last ploughing is done by casting down the land.

Bean stubble for barley requires four or five ploughings: The first must be given in April; a harrowing goes before the second, which is proper at Midsummer; and the third in the beginning of November; and it remains thus till March, when it is both ploughed and sowed. These, making a fallow and two stirrings before sowing, are performed as the stubble for wheat; but three intervening stirrings are better.

Wheat or barley stubble for beans needs only one ploughing; that is, casting down the land, and use of the harrow after sowing. And for peas, the same operation will do in a little more advanced state of the season.

Stitches are formed by bouting up the land, with yard distances; of these, the lesser one is fittest in clays and loams, and the broader in gravels and chalks.

Broad Lands are made with the fallow or foot plough, by drawing it as close as may be to the ground, and turning the land, thorough by thorough, into a flat even shape. This is commonly the first operation that is performed on a stubble of corn or lay of grass, and is called clean ploughing.

Bouting or Bouting up, is a half ploughing of the ground, by making a single stitch either from off broad lands or wheat stitches. This is performed as the first fallow, about the beginning of November, to prepare

wheat stiches for sowing barley or peas, by making one thorough, which raises a small ridge of earth; and, at near a foot distance, another in the same manner; both these together become one ridge or bout, and is very proper for giving the frosts an opportunity to kill the weeds, and sweeten the ground. The second is undertaken in the middle of February; this is to bout it down, when they harrow it plain cross-wise, and dung it; and in this state it may be left, perhaps, a fortnight; after which, it is fit to plough into broad lands, and for barley to be harrowed in. This bouting is also done by ploughing two thoroughgs off a barley stubble in the beginning of November, within a foot of each other; and makes a ridge or bout to prepare the ground for peas, which is to lie till the middle of February; when the bout is to be harrowed down; and in the beginning of March it is to be ploughed the same way that it lay before, into four thoroughgs, then sown by straining in the peas, and harrowed down directly. Bouting is, likewise, performed in summer, by first ploughing the oat stubble into broad lands, in the month of April; which is called fallowing them, in June; it must then be harrowed plain, and ploughed into bouts, and afterward left to lie thus a month; it is now to be ploughed up again, which will clean plough the ground that was not broke the last time, by running the plough the present time backward and forward through the middle of the ridge or bout, this will raise another ridge, which will lie directly on that that was a thorough before; then, a fortnight or month before the ground is sowed, it may either be backbouted or thoroughed down, and harrowed across directly; and with this ordering it will be right for sowing wheat in stiches.

Bouting down, is the making a shallow thorough on each side of the ridge of the bout, in which a sleeving, or narrow thin ridge, is left to remain in the middle. This is done for the harrows to pull down, when they are drawn across the land to level the ground, and prepare

pare it for the last ploughing and sowing of wheat. This is also called back bouting.

Thoroughing down is sometimes used for bouting down or back bouting; it is performed by drawing the wheel fallow plough only once deeply through the ridge of a bout or stich, and laying it in order for the harrows, that, by being drawn across, level the ground for ploughing and sowing of wheat. Thoroughing down will serve in fine loose earth; but if the land be not in good order, back bouting is more effectual for rendering it fine.

Four-thorough is performed by the wheel fallow plough, when the ground has been the time before fallowed into broad lands, and harrowed plain, by drawing the plough backward and forward, till four thoroughs are made almost close together; thus, begin with one of the uppermost thoroughs, then make another almost close to this, whose earth will join with that which came out of the first; and on each side of these make another as before, which forms a four-thoroughed stich. This is given in lieu of a stirring; and it sweetens the ground much in summer against the wheat season: The ground may remain thus, or be harrowed against the third ploughing, which is to bout up these stiches; when it has received the fourth, which is thoroughing down and harrowing plain, it is ready for sowing wheat.

Hacking or Combing, is commonly given as the last operation but one before ploughing and sowing wheat, barley, and turnips; it is called a clean ploughing, in case the ground is fine when it is performed, and the ploughman does not leave too great a kicker or sleeving. The method on broad lands, is, to draw a thorough with the wheel fallow plough, and to make another so close, as to throw in the earth of the first, and fill it up again; a small slip of ground is now to be left, which is called a sleeving or kicker; and then make another thorough, and so proceed, by throwing that earth in again as at first. This kind of ploughing sweetens the ground to a high degree, and tears it all to pieces; and the

the last ploughing, given afterwards, is to be done across the land, which adds to the fineness of the tilth.

OF ROLLING.

ROLLING is used on corn lands, such as barley, peas, beans, &c. are sown on; it hinders destruction by the slug, prevents damage from long and violent droughts, and nourishes the corn roots, which also stand the faster with it. The roller is to be eight feet long, and may be drawn with one or more horses; and its application is best very early in the morning in April, yet in rainy or late seasons, it may be used little, or not at all. However, a barley crop must always be two or three inches high before it be rolled.

In chalky, sandy, or loamy grounds, sown with wheat, the roller may be used in October, November, January, February, or March, in case the grounds are likely to suffer by frosts, wets, winds, or heats; and it may be drawn the lengthway over the ridges or cross them, as the wetness or dryness of the ground shall indicate.

OF HORSE HOEING.

THE intention of horse hoeing is to break and clear the ground of weeds, and to cover the roots of plants with earth in a regular profitable manner; and is in particular use with the cultivator of chiltern lands, as his crops will be neither so early nor so plentiful without it. Horse hoeing further assists in preparing the ground for rapes, turnips, wheat, or barley, to be sown, with a ploughing, after crops of peas and beans are off the ground. It is best given early in the morning.

BORDER

BORDER FOR ARABLE FIELDS.

THE most prudent method of managing the border of an arable field, is to keep it in order fit for mowing, when the land is under corn, or feeding, when fallowed; for, by means of this conduct, no ground is lost, the border paying handsomely, as well as the rest of the field; whereas the neglect of this service, on the contrary, is attended with a waste of land, and otherwise a hindrance to the convenient inspection of the crop.

OF FENCING.

FOR fencing, a single row of quicks is found to form a fine hedge, at least on gravelly and clayey soils. Each set, being not too small, may be planted at more than six inches distance from another, as well to avoid a waste, as to prevent their encountering and retarding each other in the progress of their growth. From example of planting the white thorn with most success between Michaelmas and Martinmas, and the precariousness of quicks thriving if sown either late or early in the spring, a suggestion arises of planting the latter at the time above mentioned, with better effect. And by mean of a quantity of short half-decayed litter being laid along the line, when sown, as on beds in a garden, the roots of the plants will be preserved from the frosts, take easily, and shoot with vigor: thus, also, will the earth, in the ensuing summer, especially if clayey, retain a continuance of moisture, and the forwardness of the plants, in the course of the first year, be wonderful.

In the first spring, good weeding; and, if the summer be dry, fresh litter, laid as before, will secure the success of the plants. If the drought be very great, a plentiful watering may be given, to keep the roots from damage; and the litter will preserve a humid state in the soil, notwithstanding the exhaling power of the sun.

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Having been conducted thus at first, they may, in the following summer, be left to the winds and air; and their thriving in them need not be doubted.

Cutting down the main upright stem, to make it shoot more from the side, does not promote the design of planting quick hedges, and is otherwise censurable. The time of shortening the stem, if the quick sets be small, may be attempted in the third year; but if their growth be quick, sooner.

Young trees, of whatever kind, are hurt by quicks, if planted in a line with them; and by no means should hazels have a place in a hedge row of these, for obvious reasons. Again, the roots of trees, if grown in fencing, are incommodious to the plough; and, when strong, destroy the quick wood; also, when the trees are felled, the fence, in which they stand, is almost sure to be irreparably destroyed.

The wych answers but badly, if sown for fencing.

OF THE TEAM.

EVERY farmer should endeavor to have his own team, which may consist of double the number of oxen to the horses employed. For the latter, a sufficient quantity of land, if it answer, is to be appropriated to raise oats; which, in such case, would best follow carrots or cabbages every year.

The business for draught cattle consists as follows; and their numbers must bear a proportion. First, and chiefly, the fallows, in the end of harvest, to be cleared of the weeds, and in good degree of pulverization, together with the corn being got in—instant ploughing and harrowing in seed time, when seasons offer well, &c. Ordinary work lies in carting farm yard dung to a compost hill, or bringing earth for compost hills into the farm yard; carrying this compost on to the land—carrying corn to cities, &c. and bringing manure thence—bringing wood—food for cattle in winter—

stubble;

rubble, straw, &c. &c. Though, in all seasons, diverse work presents itself for the team; and the attentive farmer will think it a primary object to provide, and profit by the timely distribution of business for it.

The Reader will find among the foregoing directions for Purchasing Cattle, some respecting oxen for draught; in which service this animal is strikingly answerable about the business of a farm. Its disuse herein, is, notwithstanding, notorious in many places, where no reasonable exception can be assigned for it: but this certainly is irreconcilable with good and saving husbandry; because ploughing, carting about the farm, &c. may be executed as well with a draught of oxen, as a horse team; and the latter incur much greater expences in supplying their food, &c. But oxen, beside all kind of home work, will perform the road draught very well; unless in countries that are hilly, and in drougthy times—In the first of these instances, it is allowed, their working is both difficult and dangerous; and in the last, the sand very soon hurtfully affects their lungs and eyes. They draw best single in harness and collars, being shod, and must be slowly driven.

Oxen, when in constant moderate work, require only to be fed with coarse hay, without corn; and when not in constant work, good straw is really thriving food for them, as by chewing the cud, they render such aliment very nutritious. They also generally escape costlily intermission from accident or malady; and when properly used, pay for their keep, and leave all the profit of their growth clear gain.

It may be worth remembering here, that such oxen as have been well drawn, not overdrawn, are advantageously spread; and on being fed, at five, six, or seven years, distribute their fat handsomely, even into the veins, and acquire a finely-marbled flesh; whereas, bullocks of three years old, that are undrawn, in gaining their fat, which they do somewhat quicker indeed, obtain it with neither proportion nor regularity, but, in over quantity and lumpiness.

From the above considerations, the superiority and expediency of the ox draught rise above comment. And to these may be subjoined what has been farther observed on its excellence, namely, that oxen are fed in less time than horses by two hours each day; and that the dung of the former is greater in quantity and makes a better manure, than that of the latter.

OF EARLY LAMBS, SHEEP, &c.

IT is certainly worth the attention of every farmer, to have *early lambs*. In order to this, there must be provided sheds, and artificial grasses, or proper roots, answering to a proposed number: These will not only defend both the dams and their lambs from the detriment of pinching and late springs, or injurious bad weather, but encourage the growth of the young ones, so that the ram lambs will be fit to put to a small number of ewes even in the following season. The milk ewes especially require a food of early grasses, or roots, a subsistence on hay chiefly being improper for them. Ivy leaves may be given them as a very suitable food.

For sheep, in general, it is indisputably necessary to their being a profitable branch of husbandry, that they have a supply of turnips, cabbages, or early artificial grasses (saintfoin excepted) in winter and spring.

To *fat* sheep, you may begin in the summer after they are full three years old; their growth, with respect to size, having then ceased, they feed kindlier, and fat sooner; they likewise will carry more tallow, and their flesh is better tasted, in their fourth, than second or third year. However, the most advantageous time for a farmer to part with his sheep, is at the third shear, they having been thrice shorn, because they are said to carry as much wool and fat on their back then, as at any age.

Sheep fattening on turnips, must have beside racks of hay or pea straw constantly in the field, they being a
necessary

necessary antidote to the rot, red water, &c. to which this food renders sheep very liable. These racks should be thinly thatched, or covered with thin boards, in order to keep the meat dry, as it then is more grateful and nourishing to the sheep.

Breeding ewes must not be suffered in fields of turnips or cole seed till their lambing time, but removed a month before, otherwise they will be too fat for yearling, and probably be lost with their lambs.

There is a trough meat recommended for sheep to eat at their pleasure, with turnips or rape, which hastens their fattening, makes their flesh eat firm and sweet, and renders it very wholesome. It consists as follows, viz. Clover hay cut into chaff, and mixed with an equal quantity of malt dust, the paler the dust the better; put this into a crib, in such quantities and at such times as you may think proper for the purpose. And to prevent the sheep getting into the crib, nail laths across it at convenient distances. Sheep fattening only on turnips, take twelve or sixteen weeks feed; but with the addition of the above trough meat, they generally fat in eight or nine weeks, provided they are in fleshy order when first put in.

To retrieve Sheep that have the *Rot*, feed them in a yard under cover with kiln-dried split peas or horse beans, mixed with pollard or bran, in troughs, with a rack of fine hay near them, and a trough of water. This is carefully to be given them, so as they may not be glutted with it, and their water must always be fresh; besides which, they must have clean littering with straw,

O F F I S H P O N D S.

AS watery and boggy land is often fit for no other use than fish ponds, which then become a great improvement of it, I shall transcribe the following particulars for making them, from an invaluable work now publishing.

lishing, and have no doubt of their being useful to many farmers in the above circumstances.

In making the pond, observe that the head be at the lowest part of the ground; and that the trench of the flood gate or sluice have a good swift fall, that it may not be long in emptying on occasion.

The best way of making the head is by driving three or four rows of stakes about six feet long, and at about four feet distance from one another, the whole length of the pond head: the first row of these is to be driven in four feet deep, that they may be very firm and secure; and if the bottom be not good, but be of a loose sand, some lime is to be added, which will harden into a sort of stone. The earth dug out of the pond is to be laid between these stakes, and rammed hard down. Other rows of stakes must be added behind and over these, and the spaces filled up till the whole is as high and as thick as is necessary. The face of it must be made even and slanting, and there must be a wash left to carry off the superfluous water in floods, &c.

If the pond carry six feet of water it is enough; but it must be made eight feet deep, to receive the freshes and rains that may fall into it.

It would also be advantageous to have shoals on the sides for the fish to sun themselves in, and lay their spawn on; beside, in other places certain holes, hollow banks, shelves, roots of trees, islands, &c. to serve as their retiring places. Consider farther, whether your pond be a breeder; if so, never expect any large carp from thence, the greatness of the number of spawn overstocking the pond.

Carp and tench will live and thrive very well together in the same pond. Where pike are kept, there should be roach or some other quick-breeding fish, to supply them with food.

Some think that pike and tench may not be kept in the same pond. They imagine that pike will not feed upon tench; but they are mistaken; for the pike is fonder of this than of almost any other fish. Ponds with
clear

clear gravelly or sandy bottoms are usually the best for breeding of fish, and foul water with muddy bottoms are the best for them to fatten in. Carp have been known to grow in one year from five to eighteen inches long, in ponds where the water of the common sewers of any town have run into them. The ordinary growth of a carp is not above two or three inches in that time, so that all the excess is to be attributed to the fatness of the water of the sewers.

Reserve some great waters for the head quarters of the fish, whence you may take, or wherein you may put any quantity thereof; and take care to have stews, and other auxiliary waters, so that you may convey any part of the stock from one to the other, and lose no time in the growth of the fish, but employ the water as you do your land, to the best advantage. View the grounds, and find out some fall between the hills as nearly flat as may be, so as to leave a proper current for the water: if there be any difficulty in judging of such, take an opportunity after some suddden rain, or the breaking up of a great snow in winter, and you will plainly see which way the ground casts, for the water will take the true fall, and run accordingly.

The condition of the place must determine the quantity of ground to be covered with water. For example, we may propose in all fifteen acres in three ponds; or eight acres in two, and no less; and these ponds should be placed one above another, so as the point of the lower may almost reach the head or bank of the upper; which contrivance is no less beautiful than advantageous.

The head or bank, which, by stopping the current, is to raise the water, and to make a pond, must be built with the clay and earth taken out of the pan or hollow dug in the lowest ground above the bank: the shape of the pan is to be an half oval, whereof the flat is to come to the bank, and the longer diameter to run square from it.

All fish ponds should be drawn once in three or four years, and the fish sorted; if it be a breeding pond, the smaller

smaller fish should be taken out to store other ponds with; and in feeding ponds all the fish should be kept as nearly as may be of a size, for the larger and smaller never all thrive well together.

Flounders will both thrive and breed in any pond, especially in a clay pond, and will be much larger than in rivers.

Bitterns, herons, otters, water rats, and sea gulls, are all great destroyers of fish, and the ponds should be kept as clear as possible of them; but the greatest of all destruction in fish ponds is occasioned by frosts.

To remedy this, some propose to break the ice, and lay in pipes, straw, and other things, to give air to the fish; but all these fail when the ponds are foul; but when they are clean, the fish seldom suffer any harm, be the frost ever so long, though no holes be broke in the ice. The stench of foul water seems to be the occasion of the death of the fish, in this case of its being locked up by frosts, and not the want of air. The cleaning of ponds frequently is of great use, as well on this as on many other occasions; and it is done at no expence, because the mud serving as manure to the lands, more than pays the expence of taking it out.

Where the ground is so boggy that carts cannot come up to take the mud, it is best to cut the ponds long and narrow in form of moats, that it may be thrown out at one toss by the laborers in clearing them; for if it require two tosses, the difference will be just the double price of labor.

Ponds made in dry grounds in the flat bottoms between hills, will also serve not only to supply the cattle with water, but the profit of the fish that may be bred in them, is greater than many are aware of, and comes without any labor or expence.

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